DOCUMENT RESUME

ED 345 803 JC 920 285

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TITLE Project SYNERGY: Software Support for Underprepared Students. Software Implementation Report.
INSTITUTION Miami-Dade Community Coll., FL. Div. of Educational Technologies.
PUB DATE Sep 91
NOTE 81p.; For a related document, see JC 920 286.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Basic Skills; Basic Writing; Case Studies; Community Colleges; *Computer Assisted Instruction; *Computer Software; *Courseware; Educational Technology; *High Risk Students; Programed Instructional Materials; *Program Implementation; Reading Instruction; *Remedial Instruction; Remedial Mathematics; Two Year Colleges
IDENTIFIERS IBM Corporation; Miami Dade Community College FL; Project SYNERGY

ABSTRACT

Miami-Dade Community College's (MDCC's) implementation and assessment of computer software as a part of Project SYNERGY, a multi-institutional project funded by the International Business Machines (IBM) Corporation designed to seek technological solutions for helping students underprepared in reading, writing and mathematics, is described in this report. An Introduction by Kamala Anandam provides an overview of the project, focusing on its implementation model and the role of faculty. After the electronic classroom and the four applications software utilized are described, faculty case studies, which comprise the bulk of the report, are presented. The case studies include: (1) "Use of PLATO Programmed Logic for Automated Teaching Operations for Reading," by Daisy Walker; (2) "Use of CSR (Computer Systems Research, Inc.) for Reading" By Gabriel Read; (3) Use of PLATO for Writing," by William Tillett; "Use of CSR for Writing," by Elaine Ludovici; (5) "Use of Realtime Writer for Writing," by Linda Tixier and Ivonne Lamazares; (6) "Use of PLATO for Math," by Bill Hajdukiewicz; (7) "Use of CSR for Math," by Carl Babski; and (8) "Using CSR for Math," by Don Orr. Each case study includes descriptions of the course in which the software is used, the students, the software, the study design and monitoring activities, providing student outcomes, and recommendations. Next, four M-DCC administrators, Victor Nwankwo, Ed Eisel, Jeffrey Lukenbill, and Gregg Sharp, offer their perspectives on Project SYNERGY. Finally, Michaela Segall provides an overview of the implementation by M-DCC's Department of Basic Communication Studies of holistic evaluation of student writing as an exit requirement. (JSP)

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Project SYNERGY

Software Support for Underprepared Students

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JC 920 285

Software Implementation Report

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Project SYNERGY

Software Support for Underprepared Students

Software Implementation Report

September 1991

Miami-Dade
COMMUNITY COLLEGE

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With twenty-two colleges and universities in the United States and Canada participating, Project SYNERGY was launched under the auspices of the League for Innovation in the Community College, a non-profit educational consortium of resourceful community colleges, and is supported by a grant of $1.3 million from the International Business Machines (IBM) Corporation. Miami-Dade Community College is the lead institution.

FOREWORD

From my perspective as a campus president, I have the distinct feeling that a quiet revolution is taking place here at the North Campus of Miami-Dade Community College. A small group of faculty is adopting extraordinarily different ways of dealing with underprepared students through the use of technology. In the past, we have created pockets of innovation throughout the campus. What I believe has been missing, however, is a systematic, sequential process of introducing, analyzing, accommodating, and ultimately using the latest advances in computer technology. Project SYNERGY represents a most thoughtful, comprehensive means of introducing technology into the teaching/learning environment of a community college. On a campus where seventy-five percent of the students are underprepared for college, the task is enormous, almost overwhelming.

Although this institution has had a remarkable record in working with underprepared students in more traditional modes, we lose, by everyone's estimation, far too many students. What happens to these students when they don't make it at a college such as Miami-Dade? Where do they go? What is their impact on the community? The loss of human potential and the cost to society are devastating. Not only must we do a better job in turning around students who arrive at our institution lacking basic skills, but also we must concurrently provide the support and the strategies to move faculty to exploit the technologies that are complementary to their own teaching styles and comfort levels.

Project SYNERGY has given momentum to the spirit of innovation and commitment to excellence. I am very pleased at the progress to date and am absolutely certain that we have the right approach to the long-term success of this project. I believe Project SYNERGY will greatly improve our students' chances for harnessing their latent abilities, and in so doing, will improve their lives and allow them to be more productive members of society.

J. Terence Kelly

J. Terence Kelly

Campus President, M-DCC - North

Acknowledgments

We gratefully acknowledge the contributions of individuals and organizations to the Software Implementation Study conducted under the auspices of Project SYNERGY.

In particular...

The International Business Machines (IBM) Corporation for its award and support.

The Roach Organization, Inc. (TRO) for making available PLATO software and Carol D. Clark, Vice President, Eastern Region, and her staff for providing the training.

Computer Systems Research, Inc. (CSR) for making available its software and Frederick M. Tracy, General Manager, Educational Software Products for providing the training.

The Realtime Learning Systems for making available Realtime Writer and its consultant, David Fletcher, to provide the training.

The College Board (especially Arthur J. Doyle, Executive Director, College-Level and State Services) for making available its Computerized Placement Tests (CPTs).

Closer to home...

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Ed Eisel and Victor Nwankwo for their support to the faculty.
Lorne Kotler and Barbara O'Brien for editing this report.
Maria Ojeda, Anays Lago, and Jesus Rodriguez for preparing this manuscript.

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Introduction by Kamala Anandam

Focus on Implementation

Project SYNERGY is a multi-institutional project funded by IBM to seek technological solutions for helping students underprepared in reading, writing, and math. As part of this project, we used some software in a networked environment at the North Campus of Miami-Dade Community College. Emerging from this experience is an implementation model (Figure 1) that will be presented first, followed by the outcomes of the first round of implementation in the context of that model.

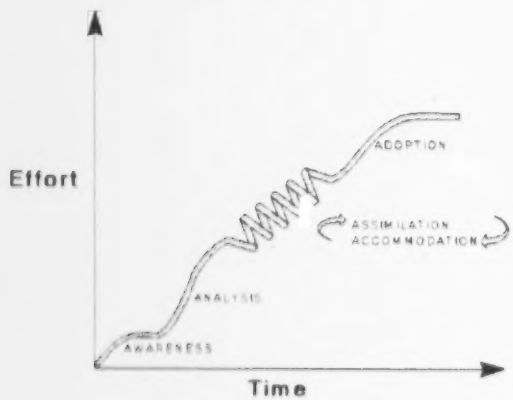

Figure 1. Implementation Model

- *Awareness is the first stage.* This is the stage when faculty hear about software in conferences or through journal articles and publicity materials.

- *Analysis is the second stage.* During this stage, faculty spend an appreciable amount of time reading about the software, talking to users, examining the software, and discussing the possible ways to use it and how to assess its usefulness.

- *Accommodation is the third stage.* At this stage, faculty begin to use the software with little or no change in what they do by way of teaching. Software is seen as an "add-on."

- *Assimilation is the fourth stage.* This is the stage when faculty begin to realize that what they do by way of teaching could change, and should change, in order to enhance the benefits of using technology. Also, faculty recognize that institutional support is required to alter some of the traditional practices in order to more fully integrate technology with teaching and learning.

- *Adoption is the fifth stage.* After several iterations of the **accommodation - assimilation** cycle, the use of technology becomes operational during this stage.

The five stages in implementation—awareness, analysis, accommodation, assimilation, and adoption—do require time and effort as shown in Figure 1.

The transition from **accommodation** to **assimilation** presents the greatest challenge to the faculty and administrators. It needs a great deal of collaborative effort and departmental support. The iterative nature of the **accommodation-assimilation** cycle does permit faculty to take steps small enough to insure their personal success and comfort while they refine their implementations. Needless to say, the **accommodation-assimilation** cycle represents the integration of technology with teaching and learning.

Based on their own degree of commitment and/or their institutional environment, some faculty follow through the stages while others drop out; some move through the stages faster than others. The underlying ingredients for those who succeed in full implementation are a *personal* purpose and a *personal* commitment to use technology. Other ingredients in successful implementation are as follows:

- Setting the stage for faculty to explore technology: accessibility, training, and professional guidance.
- Faculty members' willingness for self-evaluation and self-improvement.
- Management of faculty expectations for outcomes.

Setting the Stage for Faculty to Explore Technology: Accessibility, Training, and Professional Guidance

Under the IBM grant, we established a Local Area Network (LAN) with PS/2 Model 80 as the fileserver and 24 workstations at the North Campus of Miami-Dade Community College. (Please see page 6 for hardware/software descriptions.) This environment is referred to as the Electronic Classroom (EC), which was inaugurated on June 20, 1990, by Lucie Fjeldstad, IBM Corporate Vice President and President of K-12, Higher Education, and Multimedia sectors. We were very fortunate to have three software publishers make available their respective software on loan for a whole year:

- The Roach Organization - PLATO Software
- Computer Systems Research, Inc. - CSR Software
- Realtime Learning Systems, Inc. - Realtime Writer

In addition, The College Board provided 500 copies of its Computerized Placement Tests (CPTs) for use as pre- and post-tests. (Please see pages 7 to 8 for descriptions of the software and the CPTs.)

We were also fortunate to have nine faculty members volunteer to participate in the implementation study.

Reading
Daisy Walker-PLATO
Gabriel Read-CSR

Writing
Bill Tillett-PLATO
Elaine Ludovici-CSR
Linda Tixier-Realtime Writer
Ivonne Lamazares-Realtime Writer

Math
Bill Hajdukiewicz-PLATO
Carl Babski-CSR
Don Orr-CSR

The individual reports of the faculty are presented on pages 9 to 64.

We wasted no time in linking the software implementation study to our college's priority, The Teaching/Learning Project, which has for its primary goal the improvement of the quality of the learning environment for the students. The faculty received excellent support from the Academic Dean, Jeffrey Lukenbill, and the Director of the Center for Teaching and Learning, Gregg Sharp. Their observations about the implementation study are presented on pages 69 and 70.

The software publishers took personal interest in providing their training program for our faculty in the Electronic Classroom (EC), thus allowing for hands-on experience with the software. The EC was available to the nine faculty throughout the Fall Term (sixteen weeks) prior to opening it up for the students. This represents the analysis stage in the implementation model. The faculty's effort in exploring the software was considered an extra assignment, and they were compensated by having the task equated to teaching one course.

Providing professional guidance to the faculty throughout the semester was Victor Nwankwo, Project SYNERGY Software Implementation Coordinator. He assumed the most significant role (and executed it extremely well) in assisting the faculty in their uses of the software, including conceptualizing, planning, implementing, and evaluating. On the technological side, Ed Eisel, Project SYNERGY Project Analyst, ably handled the installation of the networked software, making it conveniently operational for the faculty and students. Their reflections on the implementation study are presented on pages 65 to 68.

With the assistance and support (technical, educational, research, administrative, clerical)

they received, the faculty moved beyond the awareness stage to the analysis stage. As you read their case studies, you will note the differences in the scope and depth of their analyses.

Faculty Members' Willingness for Self-Evaluation and Self-Improvement

Meaningful and enduring uses of software emerge from an internal frame of reference operating for each faculty member. Giving faculty the time and encouragement to explore the software from their personal perspectives sets the stage for them to engage in self-evaluation and to identify ways to improve how they teach and how they use the software. We found this to be true among our faculty, some looking *inwardly* more so than others.

One of the ways to encourage self-evaluation and self-improvement is to emphasize formative evaluation in using the software. Formative evaluation is evaluation of a product or procedure during its formation so that you can improve it along the way. In this regard, arriving at a meaningful use of software is not a one-shot deal. One has to go through several iterations of the **accommodation-assimilation** cycle in light of the formative evaluation until one is happy with how the software is being used and the corresponding outcomes.

As we implemented the software with students in the Winter Term, our faculty were mostly in the **accommodation** stage. As they monitored their studies, they began to recognize what needed to change both in what they did and in how they designed the use of the software. Some of them did alter the use of the software by adding more modules since they had underestimated how fast their students would progress. In any case, most of the faculty are now poised for the **assimilation** stage. The faculty using Realtime Writer are already in the **accommodation-assimilation** cycle by the nature of the software, and their case studies provide some insights in this regard.

A few of the faculty members experienced some conflict stemming from what they were doing in the classroom and what was happening in the Electronic Classroom. These conflicts may be stated as follows:

- Students are getting ahead of or falling behind what is being taught in class.
- Class examinations are scheduled on certain dates and that is when students *must* take the exam whether they are ahead or behind.
- The software does not have *all* the modules necessary to match what is covered in the textbook, implying that it is not useful.

Hopefully, during the **assimilation** stage we can address these conflicts and help each faculty member determine if a resolution is possible.

There is a benefit for software publishers in the way we structured the implementation model and focused on formative evaluation. The faculty members were able to pinpoint problems they encountered with the software. We strongly recommend that all software publishers work closely with educational institutions in refining their products through systematic implementation and formative evaluation.

Management of Faculty Expectations for Outcomes

Generally speaking, people have great expectations of what technology can do and should do. Anything short of their expectations is blamed on the technology. Educators are no exception to this syndrome. Designing the uses of software for instruction is neither a simple nor a small task. It takes place within the context of an institutional environment and is influenced by a variety of factors, including how familiar faculty are with the software, how they design its uses, who the students are, and how the students respond to the software. Consequently, one should not be disappointed if dramatic improvements are not observed in the first-time implementation. Rather, one should focus on what did happen and what the implications are for future implementations. In our first-time implementation, we have made a number of observations:

- After students started using the software, most faculty got energized about using it and their enthusiasm spilled over to their departments.

- As students progressed through the modules, the faculty began to raise questions about how they could better utilize the software, which students could benefit most from using the software, and how best to combine the human assistance with the software instruction in order to maximize the benefits for students.

- Among five of the seven case studies which used an experimental/control group design with pre- and post-test measures, the experimental groups registered a slightly greater gain (although not statistically significant), which is a promising pattern that we should try to enhance.

- In order to examine the data for practical significance, we looked more carefully at what was happening to individual students in the experimental groups. Such an analysis leads us to believe that a more appropriate selection of modules and/or greater time-on-task on the part of students may help the students with a "progress" grade to earn a "satisfactory" grade.

- The greater and earlier dropouts in some of the experimental groups, particularly in math, have raised our concern. Fortunately, the record-keeping facility of PLATO and CSR point to a need for human intervention in some cases when students fail consecutive modules after repeated attempts and then drop out.

- The Computerized Placement Tests published by the College Board served their purpose as pre- and post-tests for studies involving underprepared students. Being computerized and adaptive, they were far more efficient to administer and far more humanistic in testing students. Our observation that some students in the experimental and control groups registered a lower score on the post-test than on the pre-test requires further investigation. Since the CPT score was not included in the final grade, we feel that the students may not have taken the post-test seriously.

- Five of the seven faculty members and two new ones used the Electronic Classroom in Spring and Summer terms, and student use was more extensive and intensive than in the Winter term.

We will continue to use the software in the Fall Term with special emphasis on the **accommodation-assimilation** cycle and attempt to address three critical issues that have surfaced during our first-time implementation:

- Some students who have been placed in remediation courses may not require a full sixteen-week term to correct their deficiencies. Given an independent study mode with PLATO or CSR, they may finish the course in eight weeks. How will this possibility affect the way an institution structures its registration system and offering of courses?

- When PLATO or CSR (or, for that matter, any software) is perceived as supplementary to class lecture, conflicts arise about the pace of progress and coverage of content relative to the software. Is it sensible to restructure the class lectures such that the software and class activities become complementary to each other?

- What are the ways to detect an individual student's need for more challenging or less difficult modules or for human "touch" while he/she interacts with the software in order to provide the appropriate intervention on a timely basis?

In addition, we will be working with the software publishers to provide our collective feedback for improvement of existing modules, functions, and the management system, and for addition of new modules. Of particular concern to us is the pre- and post- tests included in the modules of CSR and PLATO. Fewer number of questions and the kinds of questions (mostly multiple-choice) have been the source of our concern.

As you read this report, please bear in mind that it represents our focus on the process of integrating teaching, learning, and technology. Our purpose in conducting the implementation studies is to understand this process and find ways to facilitate this process. I believe there are sufficient numbers of useful software in the market and sufficient numbers of interested faculty in every institution to make a difference in helping our students learn more effectively and efficiently. The critical question at this juncture is not "how good is the software?" but "how should educators orchestrate the human and technological resources to get the best and most benefits?" This report represents our effort at addressing that critical question.

Description of the Electronic Classroom

Hardware/Software Configuration

HARDWARE

Server-1
- IBM PS/2 Model 80-311
  - 8 Mb memory
  - 2 300 Mb hard disks
  - 1.44" floppy drive
  - Internal Tape Back-up
  - Mouse
  - 8513 Monitor

WorkStations-24
- IBM PS/2 Model 30-286
  - 2 Mb memory
  - 30 Mb hard disk
  - 1.44" floppy drive
  - Mouse
  - 8513 Monitor

Printers-6
- 1 IBM Proprinter III XL
  - Connected to server
- 5 Proprinter XL
  - Connected to Workstations
  - (Software configures them as network printers)

SOFTWARE

Operating Systems
- DOS 4.0
- Novell Netware 2.15
- ICLAS-IBM Classroom LAN Administration System
- Windows 3.0 on Workstations running under ICLAS.

Operations

When each workstation is booted, a batch file allows the option to go to PLATO or ICLAS.

If PLATO is chosen, then the workstation can run the software:
- PLATO

If ICLAS is chosen, then the following software are available under ICLAS:
- Realtime Writer
- CSR
- WordPerfect 5.1
- Write under Windows 3.0

Recommended Modifications:

2 laser printers rather than the 6 dot matrix printers. 1 dedicated administrative workstation with the internal tape drive. This means at least a Model 50 PS/2.

Applications Software Descriptions

Computerized Placement Tests
distributed by

The College Board
P.O. BOX 6800
Princeton, NJ 08541-6800
(609) 734-5782 or (215) 750-8410

Computerized Placement Tests **(CPTs)** represent an assessment program based on computerized adaptive testing techniques. This methodology customizes tests according to each student's abilities, presenting a student with a series of test questions at the appropriate level of difficulty for his or her abilities, knowledge, and background. Questions that are either too difficult or too easy are avoided, and accurate results are obtained with fewer questions administered with no time limit. These tests greatly benefit students in institutions where developmental courses are available.

The CPTs are untimed and require little proctor intervention. They include Reading Comprehension, Sentence Skills, Arithmetic Skills, Elementary Algebra, and College-Level Mathematics. Each test has from twelve to twenty questions selected from a pool of one hundred questions and usually takes about fifteen to twenty minutes to complete. A typical student takes from three to four tests and spends a total of about *ninety to one hundred* minutes on them. About half of this time is used to complete the sign-on procedure, answer the background questions, go through the familiarization screens, and take the two verbal tests (Reading Comprehension and Sentence Skills). The remainder of the time is usually spent on the mathematics tests. The tests that are administered to students are determined solely by the institution. Initial questions are selected randomly from those of average difficulty. Subsequent questions are automatically selected based on the answers to the prior question(s). Students' scores depend on the difficulty of the questions they answer correctly.

Realtime Writer
distributed by

Realtime Learning Systems, Inc.
2700 Connecticut Avenue, N.W.
Washington, D.C. 20008
(202) 483-1510 or (800) 832-2472

Realtime Writer is a tool for interactive group learning in a computerized classroom environment.

It is quite simple in concept. Students sit in a classroom at a series of interconnected computers and communicate with one another by typing on the keyboards of their individual computers and reading their computer screens. The communication is live: it occurs in real time.

In its simplest use, the software controlling the computers divides the screen of each monitor into two rectangular areas called "windows." A student types a message in a private (lower) window dedicated to serving just that one student. When satisfied with the message, the student presses a key to send the passage to the public (upper) window that appears instantly on other students' screens. There, in a scrolling dialogue, it joins messages other students have sent.

As in all classrooms, the use of this unique software is dependent on the goals, the skills, and the ingenuity of the teacher. Participation is readily available to all students. Students seem to enjoy using the system and are engaged by it.

Rather than having all students talk at once on the same channel, during most sessions involving more than a handful of students, students will typically be placed into small groups and will communicate within their group on a single channel.

It is important to realize that teachers exercise decision-making in initiating discussions, and to an extent they can control the direction of that discourse. But there is also a dynamic at work

with this system which makes this classroom setting very democratic. This occurs because students, as well as the teacher, can control the direction of their conversations. This is a process which can cause discomfort for some teachers.

Functions are provided for teacher-managed course material presentation, for recording and printing class conversations, and for managing class rosters.

PLATO
distributed by

The Roach Organization, Inc.
2607 Oberlin Road, Suite 100
Raleigh, NC 27608
(919) 781-9335

The PLATO curriculum meets student needs from remediation to mainstream to enrichment. Because of its flexible design, the PLATO curriculum can assist faculty in the often-complex planning required for effective competency-based individualized instruction.

The lessons are sequentially designed to reinforce skills previously learned, yet each lesson retains the ability to stand alone. This unique modularity allows faculty to design individual programs according to each student's needs.

The Basic Literacy program (3d - 8th grade level skills) in PLATO consists of 258 lessons in reading, 139 in writing, and 192 in mathematics. The Advanced Literacy program (9th - 12th grade level skills) consists of 82 lessons in reading, 87 in writing, and 263 in mathematics.

The PLATO Curriculum Manager allows faculty to collect information on the status of students. Reports that show the progress of students, how many times they have worked with a particular lesson, etc. can be printed. In addition, instructors can display all of the main modules or **Routing Activities** set up on the system to see what lessons are offered.

A Routing Activity is made up of a collection of lessons and tests. When students are registered in a course, they can be assigned to a given routing activity. When students sign on, they will be presented with a menu of options that will guide them through the lessons assigned to them.

CSR
distributed by

Computer Systems Research, Inc.
Avon Park South
P.O. BOX 45
Avon, CT 06001
(203) 678-1212 or (800) 922-1190

CSR's Integrated Learning System (ILS) consists of curriculum software and the associated management components. The **CSR Basic Skills** offering includes more than 400 courses (modules) which teach individual reading, writing, and math skills. The modules are organized into five levels, Level V representing college-level skills.

Each CSR module begins with a pre-test. If a student passes that pre-test, s/he is immediately referred to the next module on the list. If the student fails the pre-test, s/he is led into a tutorial which offers an explanation of the topic and guides the student through a number of step-by-step examples. The examples are followed by a series of practice exercises in which the student is asked to furnish correct responses. Incorrect responses are met with helpful hints and suggestions. Once the practice exercises have been completed, the student is given a post-test. If the student passes it, s/he is ushered to the next module. If the student fails the post-test, s/he is led through the same tutorial a second time. Regardless of whether the student passes or fails the post-test the second time, the student is moved to the next module. Only after all of the modules in the segment have been completed is the student allowed to go through the failed module(s) a third and final time. All of the courses are presented in color.

CSR's management components assist the faculty in designing and delivering a predetermined sequence of modules to their students, keep track of the students' time on task and progress, and provide reports on individual students as well as for the class.

Faculty Case Studies

Electronic Classroom

North Campus

Miami-Dade Community College

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Use of PLATO for Reading

Daisy Walker has worked with the underprepared students at Miami-Dade Community College's North and South Campuses since 1982. At South Campus, she taught reading and writing classes, but she has chosen to teach only reading at the North Campus. She received her B.A. in English from Tuskegee University in 1963 and M.A. in Reading from Barry University in 1976. Currently, she is working toward a doctoral degree in Reading and Learning Disabilities.

The Setting

About the Course

The REA 0002 students have standardized reading test scores of grade levels 5.0-9.9. To assist the students in recognizing their reading strengths and weaknesses, instruction, practice and a tenth-grade mastery of vocabulary and comprehension skills are provided. These include word definitions (contextual and implied) and common word parts. Underprepared students are also taught to understand phrases, paragraphs, and longer passages to help them study and understand texts across the curriculum, as well as printed materials encountered in their communities.

About the Students

In order to help me understand my students' problems, the Software Implementation Coordinator installed in the Electronic Classroom a computerized survey that collected and analyzed the students' background information. Their ethnicity, sex, primary language in the home, and the educational level of their parents aided me in creating a practical reading program. The current study involved mostly students from the various minority groups. The experimental group was 76% Black or African American, 12% Asian or Pacific American, and 6% Hispanic and other (Haitian) categories. The control group was 65% Black or African American, 6% Asian or Pacific American, and 29% Hispanic. There were no Whites in the program.

There were slightly more females (experimental, 53%; control, 65%) than males in both groups. Spanish or French is the basic language spoken in some of their homes (experimental, 29%; control, 41%). A small number of the students came from homes wherein their parents finished high school or attended college or trade schools (experimental, 24%; control, 38%). The average age of the control group was 21.3 years (ranging from 18 to 31). The women were older; whereas the oldest male was 24, several of the females were 30 or older. On the other hand, the experimental group's average age was 20.7 (also ranging from 18 to 31). The oldest male was 31, and the oldest female was 25.

About the Software

I chose to use PLATO software distributed by The Roach Organization. Please see a description of PLATO provided on page 8. I spent many weeks reviewing the PLATO materials; then I organized 23 Routing Activities for the students to complete by the end of the semester. These materials ranged from third- to twelfth-grade reading levels. One of the Routing Activities is presented next as an example.

PLATO ID		TITLE
Placement Test	*Module*	
ppp2ctd	bbr3p	Reading for Information
ppp2ctj	bbr3w	Characters and Events in a Story
ppp2cth	bbr3t	Topic Sentences
ppp2ctm	bbr3z	Titles and Topic Sentences
ppp4at2		The Title as the Main Idea 1-2
	bbr3o, bbr4k	Read/Understand Review
pp4bt3		The Title as the Main Idea 2
ppp2ctn	bbr31	Supporting Main Ideas With Facts
pp4at3		Locating Supporting Details 1-2
pp4bt4		Details that Support the Main Idea
	bbr36	Using Evidence to Support the Main Idea
ppp2ctk	bbr3x, bbr3y	Remembering Details
ppp2et8	bbr5k	What Evidence is There?
	bbr3y, bbr32	Remembering Story Meaning
ppp2ctl		Remembering Story Endings
ppp2dtk	bbr4x	Finding the Plot of a Story
ppp2dtm	bbr4z	Personal Traits
ppp2etd	bbr5q	Headlines
pp4tbt8		Illustration and Example

The Design

Two of my REA 0002 classes were selected to be part of this study. One class was selected to have the computer-assisted instruction (PLATO), while the other was to be tutored either individually or in small groups as part of our traditional lab services. I set four objectives for my students:

- Raise their mastery level of reading skills measured by the increased scores on the Computerized Placement Test (CPT), the Degrees of Reading Power (DRP), and the Nelson Denny (ND) Tests.
- Learn varied approaches to reading in order to adjust them for the purpose and style of material to be read across the curriculum and in their communities.
- Report in daily journals their feelings about the lab.
- Develop positive thinking about learning and reading.

The focus of the research was to evaluate the PLATO materials and their ability to meet the varied student needs in reading. After attending the workshops on PLATO and its uses, I spent many hours going through the materials both as the instructor, who always had high scores, and as "LiLi," who was a troubled student. I enjoyed the sessions, and I found myself visiting the Electronic Classroom even on my days off. I finally decided to structure the course so that my students could take a placement test to determine the need for a particular reading skill. If the students passed the test, PLATO locked them out of that skill, but if they wanted to review it, the lab coordinator or managers would unlock it for them to review. If the students failed a placement test, they could be computer-tutored, drilled, and given practice tests before taking the placement test again. This, too, would require that the Electronic Classroom personnel unlock the placement tests for the students.

Both groups received classroom instruction from me. In my class, they were presented strategies for mastering a skill and given practice exercises before being evaluated on a mastery test for that skill. Tenth grade was set as the mastery score for each skill. Students could get assistance in the labs and could schedule makeup exams for those skills they could not master. Students in the control group were tutored in our traditional reading lab in individual or small group settings. The tutors were students who had passed English and had good reading skills. The materials used in the traditional lab were grade-leveled books, kits, computer programs, and audio tape programs. Teachers could get student progress reports by simply reviewing the students' folders or by requesting them from a tutor. Sometimes they could be generated within the hour, and sometimes they could be given at the end of the day.

On the other hand, the experimental group was tutored by PLATO's computer-managed reading system. After the Software Implementation Coordinator introduced the students to the program, I assigned a time for each module. The students could, however, select skills out of sequence, and they could be tutored by the self-pacing PLATO program. There were "open" lab hours for completing modules during personal time.

Monitoring the Study

I feel that our students need to know that we care about them, their problems, dreams, and projects. This human touch seems to help them as much as the success signs that appear in the PLATO management system after completion of a task. I strongly contend that it is positive praise they need in order to become inner-motivated.

I wanted to take my students to the Electronic Classroom. After all, I wanted to be there to explain the skills that were difficult for them. After discussing this issue with the Project SYNERGY Director, I realized that the lab could become more diversified if I would thrust the responsibility on the students instead of trying to manage their time for them. She allowed me the time slot for the class, but the students had to make some decisions. They attended the lab without constant notification, and they decided which modules they wished to pursue.

I asked them to write in their journals the things that they thought about as they worked on the skills. Somehow, I felt that I would get a fair sampling of their negative and positive feelings. I thought that this would be a good way to evaluate the type of material they wanted and needed and that it would alert me to the changes that should be made in my reading program. A good example of such alerting was an instance when several students had not read the details about *Several Kinds of Horses* and gave the wrong response. I read the passage and figured that this was not a weakness of the program, but that the students were not critically thinking about all of the alternatives given. I discussed that issue during our next class period in order for them to become more attentive to details as they completed their reading assignments.

The journal responses brought about many discussions during the students' first few weeks in the Electronic Classroom, but they soon began to tell me that they had already given me all the responses that they could possibly experience. The number of journal responses diminished and, by midterm, I was getting very few of them. I decided to abandon this requirement, but I asked them to report anything that they wished to discuss with me.

The weekly computer reports of each student's progress began very slowly, and I thought that the students would never master the skills I had selected. They complained that the modules were very time-consuming, so I asked the lab personnel to observe their performances to help me figure out why there was this slow progress. I visited the lab for a short period in order to watch the students at work. We decided that our students were just lazy because they were not reading the directions on the screens. They were trying to proceed without regard for the way PLATO had designed these lessons; therefore, I asked the Software Implementation Coordinator to warn them of this senseless strategy. Their performances began to improve, and I heard no more comments about the computer being wrong. *They learned several valuable lessons from this experience: to be honest and to read directions carefully.*

Initially, I scheduled twenty-three different Routing Activities for the semester, and I told students that they could pass if they completed twenty-two of them. Some students finished by the twelfth week of the scheduled sixteen-week program, so two more modules were added. I told them that these additional modules would prepare them for Florida's required CLAST (College-Level Academic Skills Test), and I told them that they could now omit three of the modules and still meet the lab expectations. The student progress assessment was a very good monitoring device for planning and evaluating my reading program.

Student Outcomes

The control and experimental groups started off with twenty-four and twenty-three students respectively. The CPTs were administered to both these groups as pre- and post-tests. A study of the "difference" scores on the CPTs shown in Figure 1 reveals that only thirteen of the twenty-four students in the control group took both the pre- and post-tests. Of those who took the test, 54% improved their scores while 46% scored less on the post-test. In the experimental group, nineteen of the twenty-three students took both the pre- and post-tests. Of those nineteen, 84% scored better, 10% scored less and 6% scored the same on the post-test. According to the CPT scores, the students tutored by the PLATO program showed greater improvement.

The relationship between time-on-task in the Electronic Classroom and final grade for the students in the experimental group is presented in Figure 2. It is clear from Figure 2 that the students who spent longer time-on-task received a "satisfactory" grade. It is also clear that greater attention needs to be paid in the future to the students who received a "progress" grade: Should they be encouraged to spend more time in the EC with PLATO? Should the modules selected for their study be increased or rearranged?

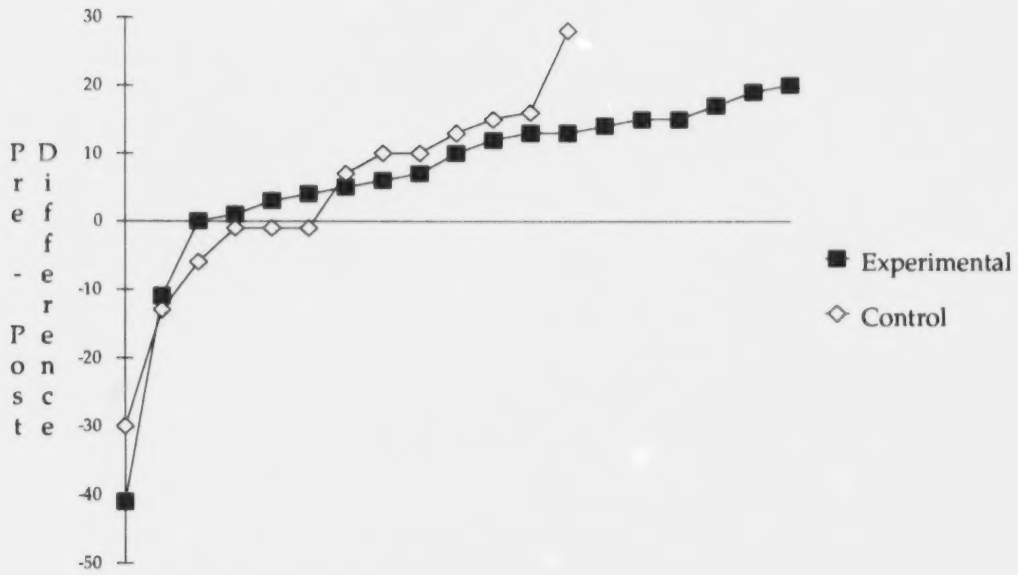


Figure 1. CPT Difference Scores for Experimental and Control Groups

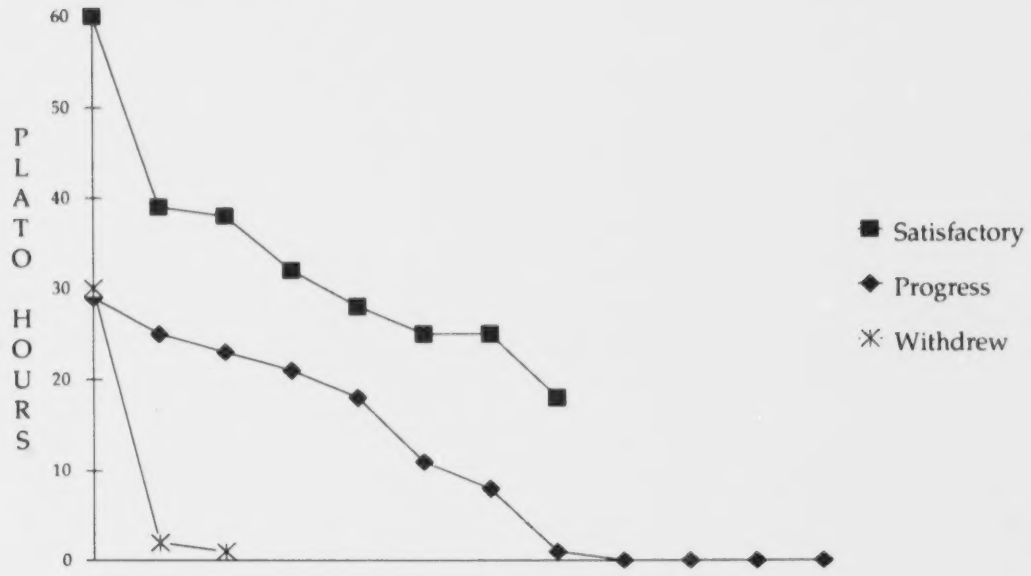


Figure 2. PLATO Hours and Final Grade for the Experimental Group

Table I

Final Grade Distribution

Group/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrew*
Experimental Group N=23	35%	52%	0%	13%
Control Group N=24*	42%	46%	0%	13%

* Due to rounding, the percentages total 101%.

To advance to other courses, students needed a tenth-grade mastery of daily class work and on a standardized test (ND, E/F or DRP).

The comparison of final grades between the experimental and control groups is shown in Table I.

The self-reports about the lab and the classroom gave the students a sense of power because they could make decisions about some things. The journals may have been difficult for some of the students to complete because they were not good writers. Some even commented on a preference for oral rather than written responses. That is one of the reasons that I used class time to discuss their feelings about our reading program. An important feature of the final self-report is that all of them preferred using the computers over simply being tutored in the traditional lab. Being able to finish at their individual rates, reviewing skills that interested them or that they needed, and keeping their progress private were some of the things they expressed in our class discussion.

Project SYNERGY assisted the students in improving some personal skills. They had to make decisions about the order in which the reading skills would be taken. They had to meet at appointed times. The levels of mastery ranged from grades three to twelve to allow all students some measures of success, so they were also challenged to master skills on high levels. Another indicator that caused me to review some tasks thoroughly was the

maximum time spent on mastering skills. Some students spent from two hours to eight hours and forty minutes trying to master compound words, understanding ideas in passages, parts of speech, locating information, and reading comprehension skills 1 (the most time-consuming skill in the course). The perseverance exemplified supports the positive impact that computers had on them as a teaching tool. A tutor or teacher may have grown impatient if s/he had to spend as much as eight hours on one skill.

Recommendations

To My Department and My College

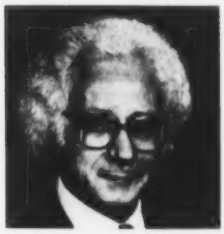
Using computers to support our classroom instruction can definitely free the professor to discuss individual strengths and weaknesses with students. The computer-generated reports helped me as a teacher to keep the students on task. These reports also gave me a summary of their progress and indicated the possible problem tasks included or the changes that should be made in the course. Thus, the computer-assisted instruction helped me to evaluate my reading course. I learned, for example, that it took some students *as little as three minutes* to master a skill and others *as much as eight hours and forty minutes.*

To further enhance computer use in teaching reading, we must have some area that is away from the classroom in order to discuss student reading problems. Students requested human tutors to help them to benefit from PLATO.

To Reading Students

The PLATO management system is an opportunity for you to review skills that you have forgotten, to learn basic skills you have never mastered, to learn at your own speed, to keep private records of your progress, and to obtain immediate reports if you wish. You will like the program and yourself if you take a positive attitude about this project and if you patiently work your way through this reading course.

Use of CSR for Reading



Gabriel Read has been teaching at Miami-Dade Community College for thirty years, twenty-six full-time. He has taught reading and English courses, both developmental and college-level, as well as courses in speech, social science, and ESL. His major commitment, however, has been to reading. He received his B.A. and M.S. in Education in 1960 and 1961 respectively from the University of Miami. Since then he has also completed advanced courses in Psychology of Reading at the University of California at Irvine and Florida International University.

The Setting

About the Course

We have revised the curriculum, course goals and objectives, and competencies in our reading program a number of times, including the latest revision this current school year (1990-91). This was essential because the nature of our students' reading and writing skills has changed over the last thirty years. It may not surprise the reader to learn that teaching reading and English at Miami-Dade is harder today than it was thirty years ago.

About the Students

The composition of the student body is definitely multicultural. Upwards of sixty countries are represented at M-DCC, a large segment on North Campus. The age spread is from sixteen to sixty, with some ranging up to eighty-five+ years. My students experience a 25-30% dropout rate, mainly because of the difficulty of the course.

The Design

I looked forward to participating in the Electronic Classroom. I hoped to pursue the CSR software as an evaluation tool to determine which students would be better suited for the Electronic Classroom and which for the regular Reading Lab (human touch).

I found the software to be satisfactory for the experiment. Many of the variables were unknown to me, and my lack of experience in this learning environment was quite evident, but I determined that the level and variety of software materials were suitable for this experiment.

The objective of this research project, employing CSR reading software as a tutorial instrument, is to demonstrate that this computer-based program can supplant the Reading Lab tutorial programs in serving the needs of our students. The reduction of funds for the Reading Lab staff has served to spur the reading faculty to test this alternative instructional mode in order to reinforce the development of reading skills in the classroom. Please see page 8 for a description of CSR.

I had committed four to six hours per week to evaluate the lessons in CSR to provide some insight into what the students would experience. By and large, the types of lessons were sufficient; in fact, the first several weeks of the CSR program were intentionally easy, so that the students would be able to adjust to the computer format and reach their levels of challenge soon enough. The level and combination of modules programmed for my class are presented below in a typical student program of instruction in the CSR system.

Week	*Regular*			*Alternate #1*			*Alternate #2*		
1	R0301A	R0309	R0316	R0502	R0504	R0507	R0805	R0810	R0817
2	R0311	R0312	R0334	R0512	R0514	R0523	R0812	R0815	R0819
3	R0302	R0313	R0336	R0505	R0516	R0522	R0804	R0822	R0809
4	R0307	R0330	R0332	R0508B	R0531	R0533	R0808A	R0823	R0825
5	R0303	R0331	R0335	R0506	R0532	R0536	R0811	R0826	R0820
6	R0337	R0503	R0506	R0509	R0524	R0534	R0811	R0813	R0827
7	R0502	R0507	R0512	R0515	R0529	R0530	R0806	R0814	R0821
8	R0516	R0513	R0514	R0535	R0537	R0538	R0818	R0828	R0829
9	R0534	R0515	R0510	R0804	R0809	R0814	R1102	R1113	R1114
10	R0524	R0522	R0537	R0816	R0819	R0820	R1117	R1118	R1119
11	R0525	R0526	R0529	R0823	R0821	R0822	R1120	R1121	R1130
12	R0538	R0533	R0527	R0829	R0830	R0831	R1131	R1132	R1321
13	R0523	R0530	R0531	R0826	R0827	R0828	R1341	R1351	R1361
14	R0804	R0805	R0812	R1112	R1119	R1120	R1323	R1325	R1331
15	R0814	R0816	R0819	R1128	R1130	R1131	R1342	R1352	R1362

The **Regular** program represents the modules designed for the entire class of twenty-four. Other **Alternate** programs (modules) were designed to start at higher levels and stretch into advanced programs. The programs thus reflect different combinations of lessons and levels.

The students were selected for the experimental group by chance registration in a section of REA 0002. The control group was selected in like manner. The students were tested to determine their individual levels of reading ability. Then a program of instruction consisting of fourteen CSR modules of three lessons each was established, and a student orientation to the operation of the computer, as well as related instruction for the lessons, were planned. Provision was made for a post-test to determine the amount of progress the students made.

Monitoring the Study

I spent one hour a week in the Electronic Classroom at the time the students were there. I did not participate in the computer program process, but I did serve in other class logistics when required to do so. I checked the weekly report to determine how well or poorly the students were doing in the lab. I attempted to cover the particular skill in the classroom which the students were practicing in the lab.

The enthusiasm was quite high at the outset of the program. The feedback was good, and at times it seemed as if the computer were a better teacher than the instructor. About half of the students were faithful in classroom attendance and in lab attendance. Student reaction by and large reflected a positive experience in the Electronic Classroom.

I discovered about four weeks into the computer lab program that not all students were suited to this particular type of educational environment. Those who had developed reading and thinking skills seemed to adjust to the computerized instruction quite handily. They demonstrated readiness for independent study. Those who had experienced failure, with the resultant negative self-image, did not succeed in the lab. Then there were the students who needed the human touch, the gregarious students who thrive best in a social setting surrounded by people, unlike the loners who work best alone, who can identify with the computer and manipulate it effectively. It would be quite useful to develop an evaluation tool to distinguish between those students who will be able to adjust to the computer and those who will not.

Student Outcomes

The objective of this experiment was to have all factors relating to it as equal as possible, except for the type of lab instruction provided for each group. The classroom instruction and the text were the same. The types of materials (that is, reading skills) were the same. The only differing factor was the learning environment to which the students were exposed.

The types of quizzes, handouts, and reinforcement were as nearly identical as I could make them. We studied analogies, newspaper current events, and skimming-scanning exercises in both classes under the same circumstances.

Final Grade Distribution. A comparison of the final grade distribution in the experimental and control groups is presented in Table I. The experimental group registered a greater percentage of "satisfactory" grades and smaller percentage of "withdrawals."

CSR Modules Passed. The relationship between students' final grades and the number of CSR modules passed is illustrated in Figure 1. The variation among individual students is observable in Figure 1. For example, one student who passed almost fifty modules dropped the course and another passing fewer than forty received a "satisfactory" grade. Overall, however, students passing more modules had received "satisfactory" grades.

CPT Test Scores. The difference in the pre- and post-test scores of CPT is presented in Figure 2 for both experimental and control groups. There were fourteen students in the experimental group and nine in the control group for whom both the pre- and post-test scores were available. A total of 71.4% of the students in the experimental group and 66.6% of those in the control group showed a positive gain.

The students in the experimental group who made the greater gains appeared to work well with the computer. They readily adapted to the independent study environment. Four of the students finished three to four weeks early, requiring effort on my part to develop additional lessons from related computer programs.

Table I

Final Grade Distribution

Group/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrawals*
Experimental Group N=24	54%	21%	21%	4%
Control Group N=26	38%	31%	12%	19%

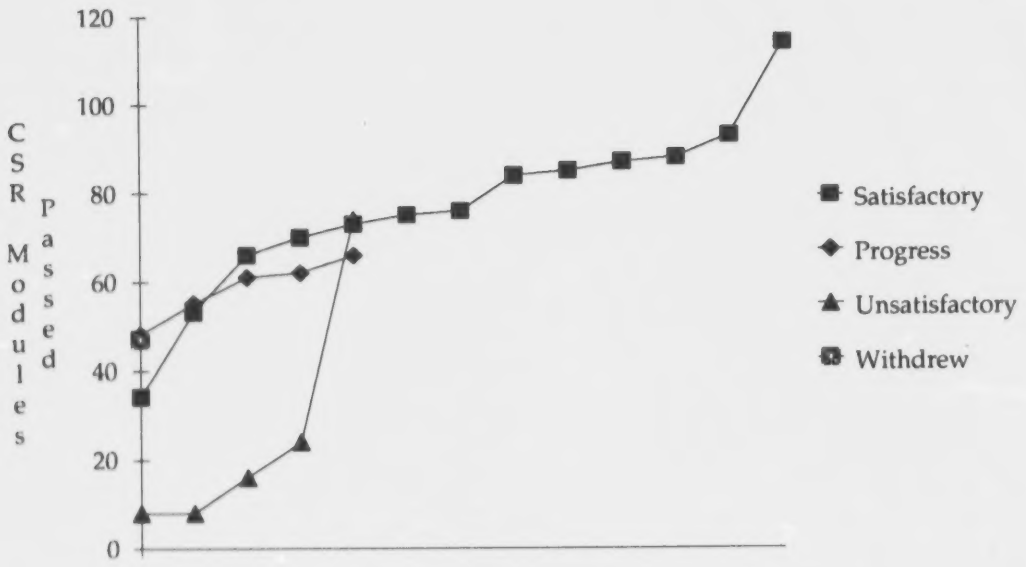


Figure 1. Number of CSR Modules Passed and Final Grade

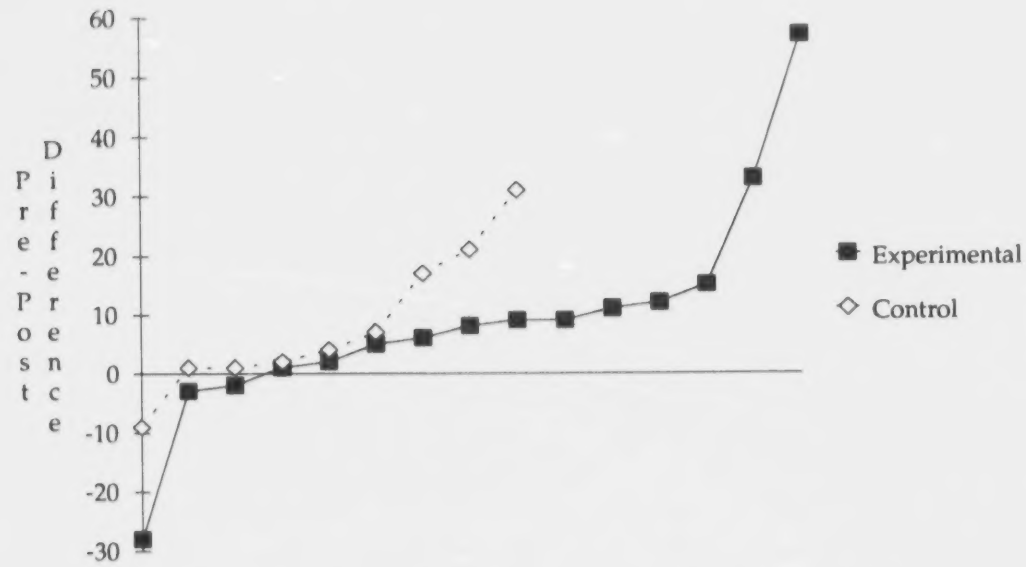


Figure 2. CPT Difference Scores for Experimental And Control Groups

Recommendations

The experimental program was definitely worthwhile. Individualized lesson selections should be made at the beginning of the program, and it would be wise to anticipate making adjustments after the midway point of the semester. Normally, the instructor uses the pre-test scores to formulate lesson selection for the students and then adjust as the semester progresses. Because of the need to initiate the program quickly, it is necessary to anticipate combinations of lessons. Lab instruction should be monitored during the third and fourth weeks to determine the appropriate lesson selection for each student.

I would recommend a student-selection tool whereby those students who can best adjust to computers would be chosen for lab instruction. If the selection can be made early on, then the placement of the students in an appropriate learning environment would produce a greater degree of success and student satisfaction.

The fact that a subsequent grant for the further exploration and pursuit of a computerized reading program was approved by my campus administration is sufficient evidence that the participants in the reading segment of Project SYNERGY have effectively communicated with fellow colleagues and administration on the validity of this experiment. Continued study and development of computer-assisted reading instruction is strongly advised. Development of the basic skills, of language, of organization skills, and of critical thinking skills to coincide with the technological age is not only desirable but urgently needed by those who expect to survive adequately in the next century. The projected programs will provide the basis and format to serve that need.

Use of PLATO for Writing

William S. Tillett has been a faculty member at Miami-Dade Community College for twenty-two of his thirty-one years in education. He was employed in 1969 to lead a group of four other English faculty members to develop a writing program for students who were underprepared to meet the writing skills necessary to function in the college environment. Tillett received a B.S. in English (1960) from Campbellsville College and an M.S. in Counseling & Guidance from Indiana University. He is working toward a doctorate in Curriculum (Florida Atlantic University) and Counseling & Guidance (Indiana University).

The Setting

We are well into the computer age. Even though I am approaching the twilight years of my career, I feel that Project SYNERGY gave me a golden opportunity to be involved in experiencing what I think is the most exciting program that I have heard about working with computers and instruction. Being able to individualize the instruction of my students has always been a monumental task; to be able to follow their progress has been an even greater one. The PLATO program seemed to be able to help me do both, so I knew that I wanted to be involved in this study.

About the Course

ENC 0020 is a course for developmental students whose performance on the CPT indicates that they need remediation in their writing skills. The students used my textbook *From Paragraph to Essay*; the course content was organized as follows:

Week	*Chapter*	*Writing Topics Covered*
1		Placement Diagnostic Testing Lab and Book Assignments
2	One	Introduction to Paragraphs
3	Two Three Four	Topic Development Order Transition/Coherence
4	Five Six	Polishing Up the Paragraph Summarizing Material into Paragraphs
5	Seven Eight	Methods for Developing Paragraphs Descriptive Paragraphs
6	Nine Ten	Process Paragraph Illustration/Example Paragraphs
7	Eleven	Introduction to the Essay; Video: *How to Write a Composition*
8	Twelve	Parts of the Essay; Practice Essay in Class
9	Thirteen/Fourteen	How to Write a Verbatim Essay; Practice Essay in Class
10	Fifteen	How to Write a Descriptive Essay; Practice Essay in Class
11	Sixteen	How to Write a Process Essay; Practice Writing in Class
12	Seventeen	How to Write an Example Essay; Write in Class
13		Departmental Exams (1st Attempt)
14		Departmental Exams (2nd Attempt); Post-test as Assigned
15		Work Only If Required

The classes met twice a week, one and a half hours each on Tuesdays and Thursdays; students got compositional skills information in class and practiced writing on Tuesdays. The students were required to spend an additional twenty hours per semester dealing with writing skill problems.

About the Students

The ethnic makeup of the class participating in the Electronic Classroom was thirteen Blacks, eleven White Hispanics, and one Chinese. The ethnic background of the class participating in the College Prep Lab (control group) was nine Blacks, ten White Hispanics, one Chinese, and three Anglo-American Whites.

About the Software

After a quick review of the PLATO material, I decided to use the Advanced Literacy Skills rather than the Basic Skills for my ENC 0020 class. I felt that the basic level of the program was not advanced enough to really do the job. However, this level would be excellent for ENC 0002 students. Please see page 8 for a description of PLATO.

It is very difficult at this point to determine how much time I spent on reviewing the PLATO modules. I usually spent each Thursday morning reviewing the modules, but additional time was given to planning and preparing materials and a schedule to go along with the program.

Since my students have demonstrated their lack of language and mechanical skills, it was not difficult for me to decide which modules they needed. The program lends itself to a very quick review of all the instructor-assigned modules. A pre-test is given on each module and if the student understands it, s/he passes and moves on to the next one. It takes very little time to find out if the student understands the concepts presented in each module. If the students pass, they move on. If not, they spend the time necessary to learn the material, take a post-test and, if passed, move to the next module. If not, they do the module over and over until the skill has been mastered.

I spent many hours reviewing the entire PLATO program until I selected those modules and the level which I felt were most closely identified with the skills I had already been teaching my students. As I spent the hours reviewing the PLATO material, the two factors that influenced my decision in structuring the program were the skills most consistently needed by underprepared students and how much time was needed for them to master these skills.

Following are two examples of modules (or **Routing Activities**, as PLATO calls them) I selected for my course: UNIT 2 (during Week 3) and UNIT 11 (during Week 12). Each module consisted of tutorial, application, pre-/post-tests, and sometimes Tests 1 and 2.

UNIT 2 (Grammar)
Routing Activity

PLATO Ref.	Module Title
hw2	Grammar
hw2a	Recognizing Verbs
hw2al1	Recog. Verbs: Tutorial
hw2al2	Recog. Verbs: Application
hw2at1	Recog. Verbs: Pre/Post Test
hw2b	Identifying Subjects
hw2bl1	Ident. Subjects: Tutorial
hw2bl2	Ident. Subjects: Application
hw2bt	Ident. Subj. Pre/Post Test
hw2bt1	Identifying Subjects: Test 1
hw2bl2	Identifying Subjects: Test 2

UNIT 11 (Logic & Organization)
Routing Activity

PLATO Ref.	Module Title
hw5	Logic and Organization
hw5a	The Topic Sentence
hw5al1	Topic Sentence: Tutorial
hw5al2	Topic Sentence: Application
hw5at1	Topic Sent.: Pre/Post Test
hw5b	Unnecessary Sentences
hw5bl1	Unnecessary Sent.: Tutorial
hw5bl2	Unnec. Sent.: Application
hw5bt1	Unnec. Sent.: Pre/Post Test

(Continued)
UNIT 11 (Logic & Organization)
Routing Activity

PLATO Ref.	Module Title
hw5c	Order of Sentences
hw5cl1	Order of Sentences: Tutorial
hw5cl2	Order of Sent.: Application
hw5ct1	Order/Sent.: Pre/Post Test
hw5d	Transitional Devices
hw5dl1	Trans. Devices: Tutorial
hw5dl2	Trans. Devices: Application
hw5dt	Trans. Dev.: Pre/Post Test
hw5dt1	Transitional Devices: Test 1
hw5dt2	Transitional Devices: Test 2
hw5e	Improving Structure
hw5el1	Improving Struc.: Tutorial
hw5el2	Impr. Struc.: Application
hw5et1	Impr. Struc.: Pre/Post Test
hw5f	Paragraph Dev. & Org.
hw5fl1	Par. Dev. & Org.: Tutorial
hw5fl2	Par. Dev. & Org.: Applic.
hw5ft1	Par. Dev. & Org.: Pre/Post Test

The Design

For the most part, teaching the structure of a composition is relatively easy compared to the many-faceted problems encountered when one tries to teach students how to use the grammar and mechanics of writing. Each student presents unique and different kinds of problems.

This challenge has been met successfully to a great extent in the present College Prep Writing Lab, but rooms, personnel, and funds are lacking to give the help that really is needed. At present, there are four or five students in a group getting assistance from one peer tutor in the College Prep Writing Lab. The Electronic Classroom offered the student one-on-one help. The computer, of course, took the place of the tutor.

The two classes selected for this study met twice a week, at 8:00-9:15 a.m. and 9:25-10:40 a.m. respectively on Tuesdays and Thursdays. The curriculum structure for the control group (College Prep Writing Lab), which met 8:00-9:15 a.m., was as follows:

- Writing skills and practice writing on Tuesdays.
- Grammar and mechanical skills instruction on Thursdays.
- Twenty hours of writing, grammar, and mechanical skills assigned in the College Prep Writing Lab.

The curriculum structure for the experimental group (Electronic Classroom), which met at 9:25-10:40 a.m., was as follows:

- Writing skills and practice writing on Tuesdays.
- Electronic Classroom instruction (computer) on Thursdays.
- Twenty hours of writing, grammar, and mechanical skills assigned in the Electronic Classroom.

I had several hypotheses:

- Writing Lab attendance would be higher in the class using the Electronic Classroom than in the class using the College Prep Writing Lab.
- The drop-out rate would be lower with the class using the Electronic Classroom than with the class using the College Prep Writing Lab.
- The completion rate would be higher with the class using the Electronic Classroom than with the class using the College Prep Writing Lab.

Monitoring the Study

Each week I attended the Electronic Classroom lab hour with the students. With the outstanding lab monitors, I was often not needed during the entire class session. I would spend the first part of the class going from student to student to see how they were progressing. The second part of the period I

would spend reviewing PLATO reports and tracking each student's work and progress.

In the control group, I reviewed the same modules; however, the control group used handouts provided in the class and the College Prep Writing Lab. The material was reviewed by the instructor and a post-test was given on each module. With the help of two peer tutors and the instructor, it still was a long and tedious task of keeping up with all modules the students worked on.

The initial proposal included the identical PLATO modules for the experimental group. However, as the semester progressed, I discovered that a few highly motivated, or the more skillful, students in the classroom were finishing the program far too early to be released from the Electronic Classroom. On an individual basis, when I discovered this happening, I assigned the students additional PLATO modules.

Tracking students' progress has always been something that I have felt needed more attention. In the control classroom, we gave four or five quizzes on the homework. This always takes so much time that often it is not given the attention it fully deserves. The computer does this beautifully. It manages the pre-test, the drills and practices, and the post-tests. This assessment is vital for the instructor, and yet, the job is always so thoroughly completed and easy to understand. I felt the relief from this pressure and thus was able to have more time to assess the students' work. It freed me to spend more time with students and their individual writing needs.

Each week, I would return to the students their individual printouts. They were fully aware that I was monitoring their work, so there was no doubt in their minds that I knew of their time spent in the lab and their progress with their assigned modules. As the weeks passed into the semester, it was easy for me to identify students who were having problems. It was easy to see the students who were motivated to spend time on their work and those who were not motivated. Another very interesting observation that soon emerged was the fact that students were able to have multiple opportunities for success.

As instructors of underprepared students, we often find ourselves repeating the same concept of instruction over and over, but I doubt any of us would explain something sixteen times to the same student. I had one student who did one module over sixteen times. He finally mastered the module and moved on to complete all his modules. Would I have been this patient? I don't think so.

Student Outcomes

Of the twenty-five students enrolled in the Electronic Classroom, eighteen took the TABE test as the pre-test; the median score (grade-point level) was 6.8. Of the twenty-three students enrolled in the control group, eighteen also took the TABE; the median score (or grade-point level) was 6.0. Although the grade-point levels of the two groups were incredibly close, they were not grouped to be so. In my opinion, it is the Multiple Assessment and Placement Services (MAPS) test that did this incredible job of placement.

In the control group, four students out of twenty-three dropped out. In the Electronic Classroom, only one out of twenty-five students dropped out.

The final grade distribution and departmental holistic scores for the experimental and control groups are presented in Tables I and II respectively. Please see page 71 for details on holistic assessment.

Table I

Final Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrew*
Experimental Group N=25	44%	44%	8%	4%
Control Group N=23*	61%	17%	4%	17%

* Due to rounding, the percentages only total 99% for this group.

Table II

Departmental Holistic Scores for Experimental and Control Groups

Possible Holistic Scores	*8*	*6*	*4*	*2*
Experimental Group N=24	4%	42%	54%	0%
Control Group N=18	0%	78%	22%	0%

I would not judge PLATO solely upon comparing the final results of the students in the experimental and control groups. The control classroom used the collective materials, teaching styles, and curriculum that I have developed over the past thirty-one years. I used my own textbook and, therefore, I was totally prepared and skillful in teaching it. On the other hand, the PLATO materials were developed by other educators (I think) who are equally prepared (I think). I was the one who had to become familiar with their materials. Time, planning, and much energy was given to this task. I feel I did an incredible amount of learning just to get familiar with the curriculum and the process of using the computer and the software. This was the year of my stepping into the computer age. I had always felt that one day I would have to do it and I would not be ready. I was wrong. I am now ready.

I felt that, if I could come out showing at least comparable growth and progress between the experimental and control groups, I could call the results a success. Even though I see the control group having higher rates for completion of the class, I see far fewer dropouts in the Electronic Classroom. The Electronic Classroom student definitely felt better about doing work in the lab. It was much easier to monitor the progress of my students in the Electronic Classroom. For example, the relationship between students' grades and the number of hours students spent in the EC or traditional lab is presented in Figures 1 and 2 respectively. While the experimental group demonstrated individual variation in this relationship, the control group seemed to exhibit a more uniform relationship. In future studies, I would like to capitalize on the individual variation in the experimental group and help the students learn even more. Without a computerized management system such as PLATO's, it would not be feasible to allow for the variation and maintain the quality at the same time.

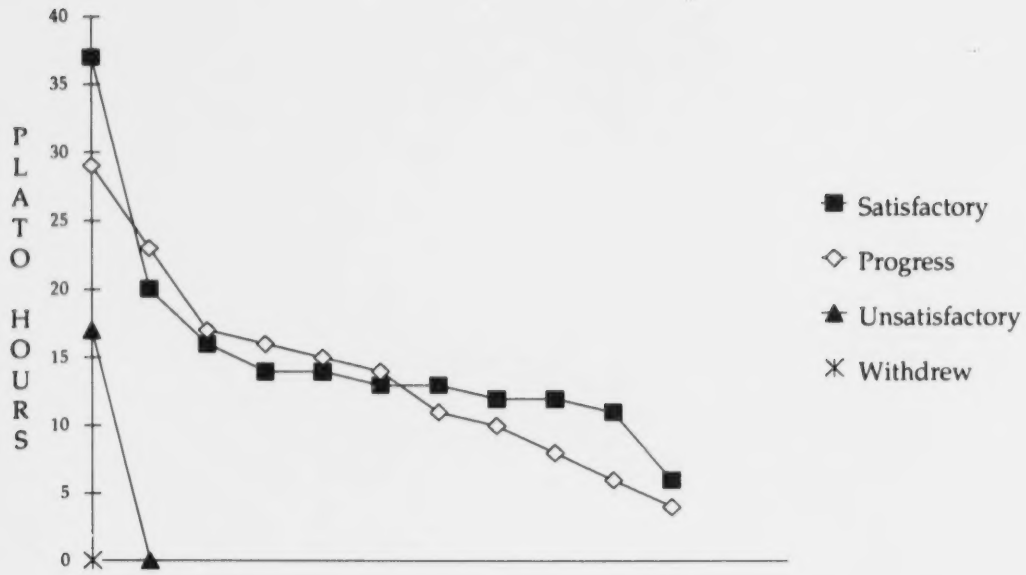


Figure 1. PLATO Hours and Final Grade for The Experimental Group

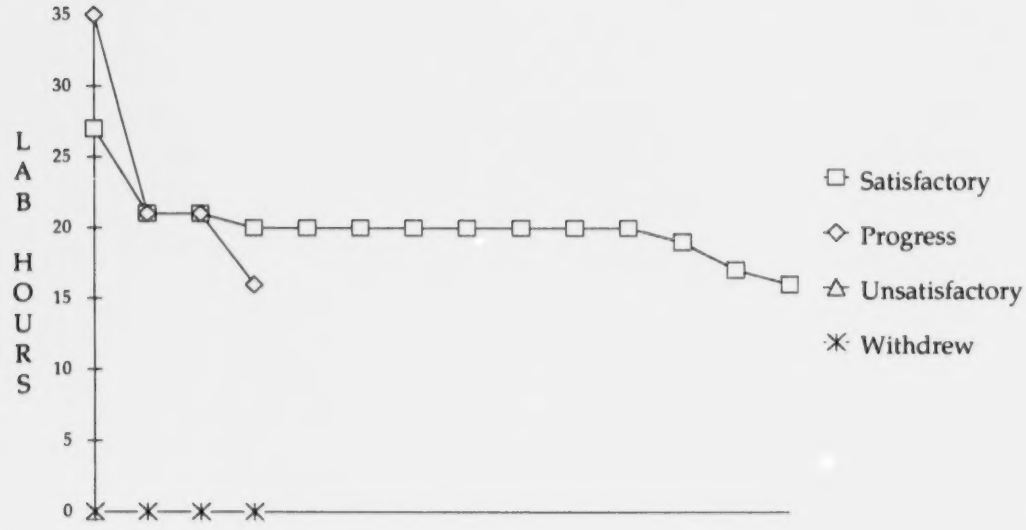


Figure 2. Lab Hours and Final Grade for the Control Group

Recommendations

I am excited about the Electronic Classroom. Its time has come. I think we should definitely move in this direction. While I was satisfied with the PLATO materials, I am not willing to say that they are the best. I have not reviewed any of the other programs developed for English education and the underprepared students. However, I do feel we should go in the direction of using the computer in the classroom. I would recommend to our administration that it may be a good place to start. I like it. My students liked it. Maybe this program could be called the starting place at Miami-Dade of the Electronic Classroom.

Use of CSR for Writing

Elaine Ludovici has taught writing courses at Miami-Dade Community College, North Campus, for the past sixteen years and has served as Coordinator of the College Prep Writing Program and Labs for fourteen. She holds a B.A. and an M.A. in English (Clarion University, 1972 and 1974 respectively) and has completed some post-graduate courses in Education Administration at the University of Miami (1978-1980).

The Setting

About the Students

In the past, underprepared writing students at Miami-Dade identified themselves and sought remediation on their own. Today, however, underprepared writing students are identified at placement by the Multiple Assessment Placement Services (MAPS) test, and they are required to enroll in a developmental course, College Prep Writing, before taking their core courses.

The challenges that teachers of underprepared students face in the classroom are marked not only by the students' deficiencies in basic academic skills, but by other discernible learning and motivation problems as well, including poor social skills.

Besides attending class, underprepared writing students are required by state and college mandate to spend additional time on task. For North Campus students, this means a lab requirement for approximately 1,200 to 1,500 students per major term. The students enter the Writing Lab with varying levels and kinds of deficiencies. Needless to say, flexibility in program design and variety of curriculum, as well as staffing and space itself, are critical to the success of the program.

About the Software

When I selected twenty-six CSR modules for the Electronic Classroom, I was most comfortable with Level V because these "courses" were directly related to the skill areas I covered in the class. I discovered that CSR was forgiving. If the student typed the number of the sentence that was correct or incorrect instead of the appropriate letter, it would accept the response. CSR was also a helpful tutor. If the student chose the wrong answer, it would not just say, "Try again," but instead would offer additional explanations and guide the student to the correct response.

What helped me the most in evaluating the software, however, was watching my students use the program. I had invited students to meet me in the Electronic Classroom so that we could evaluate the software together. I watched them work through the courses, noting which courses and sections were giving them the most problems, and I timed them. This helped me in my selection of the courses, and in determining how many I could expect them to complete during their lab hours.

I then organized the CSR courses to correspond to my weekly assignments so that I could refer to what my students reviewed in the lab and they could see a connection between what we were doing in class and what they were studying in the lab. I found this to be very exciting because, finally, I would know what my students were doing in the lab. Please see page 8 for a description of CSR.

The Design

It is important to bear in mind that this study is based on formative rather than traditional research. Two mid-afternoon classes were randomly selected as the control and experimental groups. Each section met in the

classroom twice a week (2 1/2 hours), and each section followed the same course syllabus. Each was pre- and post-tested using a diagnostic writing sample and the College Placement Test of Standard Written English. Both groups were told that they would be required to complete 20-35 lab hours by the end of the term. The control group was directed to the College Prep Writing Lab and the experimental group to the Electronic Classroom and the tutorial services in the College Prep Writing Lab.

The biggest difference between the two groups was that the experimental group was given a list of twenty-six skill assignments to complete in the Electronic Classroom, whereas the control group was advised to make appointments with a tutor or to use the independent study feature of the lab, which would allow them to work on their homework or any other assignment of their choice without an appointment.

It was hoped that the structured but flexible program in the Electronic Classroom would help to improve student attendance, attitude, motivation, retention, and ultimately performance. The original hypothesis was stated as follows:

Lab attendance in the Electronic Classroom should be more regular and more frequent than attendance in the CPWL. Student retention should be greater in the experimental group due to easier access to the lab, clarity of lab assignments and expectations, and general interest in the technological approach to writing instruction. Performance (as determined by pre-testing, post-testing, and final grades) should prove to be similar in both groups: no significant difference in numbers passing to ENC 1100.

During the course of this study, I collected data on the students in both groups from various computerized databases maintained by the college. Then I discovered my first glitch, the makeup of the two groups.

The control group began with eighteen students attending class regularly. One withdrew after the first six weeks and two after twelve weeks. (None offered explanations.) A total of fifteen students completed the course. The control group had a high percentage of minorities (95%). One-third claimed English as a second language. One-third was enrolled in College Prep Writing for the second time. One student in this group identified himself as having a learning disability (LD); however, he had chosen not to continue LD classes after high school. The average MAPS Reading score for this group was 9.1; the average MAPS Writing score, 24.4.

The experimental group began with twenty-one students attending regularly. One student withdrew at midterm due to personal problems, one withdrew after ten weeks, and a third withdrew within the last month because he claimed he would never be able to complete his lab hours. A total of eighteen completed the course. The experimental group also had a high percentage of minorities (80%). Two thirds claimed English as a second language, and one half were enrolled in College Prep Writing for the second time. Four students in this group identified themselves as having learning disabilities; three were enrolled in our LD Lab. The average MAPS Reading score for this group was 6.2; the average MAPS Writing score, 23.1.

Fortunately, however, formative research allowed me to modify plans as necessary. Although setting up the control and experimental groups provided a baseline for comparison, the focus of the study was not on proving one methodology over another; the focus was on enhancing the curriculum, on deciding how best to use the CSR software and the Electronic Classroom to help students, and on making improvements along the way. As I had stated in my original proposal, "...even if the results of both groups are, at best, equal...the prime objective is to provide flexibility. The Electronic Classroom can free us to work independently with our students: the basics could be delivered through CSR and the tutors will have more time to work with the students one-on-one." (Perhaps the incorporation of technology would prove to be cost efficient as well!)

Monitoring the Study

In the beginning, I felt overwhelmed with understanding, dealing with, and using the technology. I realized that I needed more communication with my colleagues, as well as more communication with and support from the Project SYNERGY staff. Most of all, I needed more time to think, to plan, and to create. If I was guilty of anything, it was that I had not built in more planning time with the Electronic Classroom staff so that we could work through the mechanics of *how* to accomplish what it was we both wanted to achieve. Yet I had expected almost as much from the Electronic Classroom, which was in its first semester of operation and serving reading and math students as well, as I had expected from the College Prep Writing Lab, which was in its fourth year of operation and serving only writing students.

I kept records on students' test scores, class and lab attendance, retention rates, and assessment of in-class writing assignments, but as the study progressed, I began to feel torn between traditional research and formative research. Monitoring the study also meant monitoring lab work, and I was never sure how to handle that. Normally, I do not spend a lot of time monitoring my students' lab work, and I questioned the advantages of the program to the faculty if getting involved in the Electronic Classroom meant taking on additional responsibilities in the lab or taking home additional paperwork. Thus, I decided to minimize my involvement in reviewing the lab reports I received from the Electronic Classroom. I thought that if I left the two groups alone, the results would speak for themselves.

What I did not expect was the reaction I got from the experimental group as the students progressed in their lab work. Some students who admitted to having reservations about the lab stopped by my office to tell me how good they felt when they saw "Congratulations, you scored 100%" across the screen. Others who were repeating the course said they liked the flexible hours available in the Electronic Classroom. When the students discovered that I was getting comprehensive lab reports on a weekly basis, they constantly asked me for feedback. They wanted to know how they were doing, if I had a handout to help them with a specific skill they were having difficulty with, or if they had completed enough lab hours. CSR lab reports were easy to read and provided a lot of information ranging from the number of attempts and the amount of time spent on each skill to the number of skills mastered.

While my students in the experimental group seemed to be communicating with me about their classroom and lab performance on almost a daily basis, students in the control group were not. During student conferences, I would refer to the Lab Record Sheets (which are updated upon each visit to the lab) to assess their work; but more often than not, the handwritten lab reports did not provide me with much more than the number of times the students had reported to the lab. The reports gave no assessment of the students' work or progress, so it was very difficult to tell whether a student was having any difficulty or making any progress. Any discussions regarding lab work that I had with students in the control group seemed to focus on the number of hours they were required to put in rather than the kinds of skills they were working on.

On more than one occasion, I found myself using the Multiple Course Reports to explain to students that the problem areas in their papers were the same problem areas they were experiencing in their work on CSR. This seemed to motivate them to pay closer attention to what they were doing in the lab and they began to ask me for supplementary materials. Finally, I felt the lab evolving into an extension of my course. I slowly began to feel more comfortable with what the experimental group was doing in the lab, perhaps because I had selected the materials and coordinated them with my daily lesson plans.

I could not forget that my experimental group had tested at a lower skill level than my control group. Regardless of the research project, I wanted to do everything I could to help them achieve success. In fact, I had built tutor

appointments into my course syllabus and had the CPWL staff make special coupons for students in the experimental group. Only a few followed through on tutor appointments, and the students who needed the extra tutorial support the most either started too late or continued only to work through the CSR modules.

The semester, obviously, was not without problems, but for the most part, the majority were easily resolved. It seemed that none of us was fully prepared for what could or would happen. At one point, a few students complained that their lab reports were incorrect. When I investigated the discrepant reports, I discovered that the student had either signed in on the wrong sheet, held the key down too long, or not hit the key with "just the right touch." My students sometimes complained that the number of open lab hours was too limited.

Still, the students' reactions to the Electronic Classroom were more favorable than not, and that motivated me to get more involved. I made special arrangements to meet my students in the Electronic Classroom to introduce them to the word processing program, *Windows Write*. I had planned editing and revising activities to be done on the word processor. At first, I was apprehensive because I am not expert at word processing myself, so I was not sure if I was expecting too much, especially of remedial students. My fears dissipated, however, when I saw how quickly my students responded to the instruction. Within ten minutes, everyone was typing, and a few minutes later, my students were calling me over to help them with their revisions.

Student Outcomes

Class and lab records for both groups indicate no significant difference in the areas of *attendance* and *retention*.

Ever since our department started to enforce the double-contact-hour requirement in College Prep Writing classes, we have noticed a pattern with our students. It seems that rather than attending the lab regularly throughout the term, students wait until well into the term to fulfill their lab hour requirement. Four weeks after both labs opened for instruction, 85% of the students in the experimental group had already accessed the Electronic Classroom, averaging four hours and thirty minutes per student, while only 51% of the students in the control group had accessed the College Prep Writing Lab, averaging five hours and fifteen minutes per student.

Furthermore, students in the experimental group seemed to manage their time more efficiently and spend more time on task. Those students in the control group who waited until the last minute to fulfill their lab requirement ended up working independently. Lab records do not indicate what they worked on: they could have been working on anything from homework in the text to a specific writing assignment. Students in the experimental group, on the other hand, were working on task in the Electronic Classroom and toward the end of the semester at least twelve had made appointments to review their papers with tutors (ten with tutors in the College Prep Writing Lab, two with tutors in the Learning Disabled Lab).

When we review the overall *performance* of the students, particularly if we compare the experimental and control groups, it is important to keep in mind that these two groups entered the course at varying levels as shown in Table I. This score was derived from my assessment of the students' essays. The holistic scores for the end-of-term essays were derived by departmental assessment and are shown in Table II. Please see page 71 for details on holistic assessment.

Table I

Holistic Scores for Students' Writing at the Beginning of the Term

Group/Holistic Scores	7-8	6	4	2
Experimental Group N=18	0%	0%	62%	38%
Control Group N=16	0%	0%	94%	6%

Table II

Departmental Holistic Scores at the End of the Term

Group/Holistic Scores	7-8	6	4	2
Experimental Group N=18	0%	33%	67%	0%
Control Group N=16	6%	69%	25%	0%

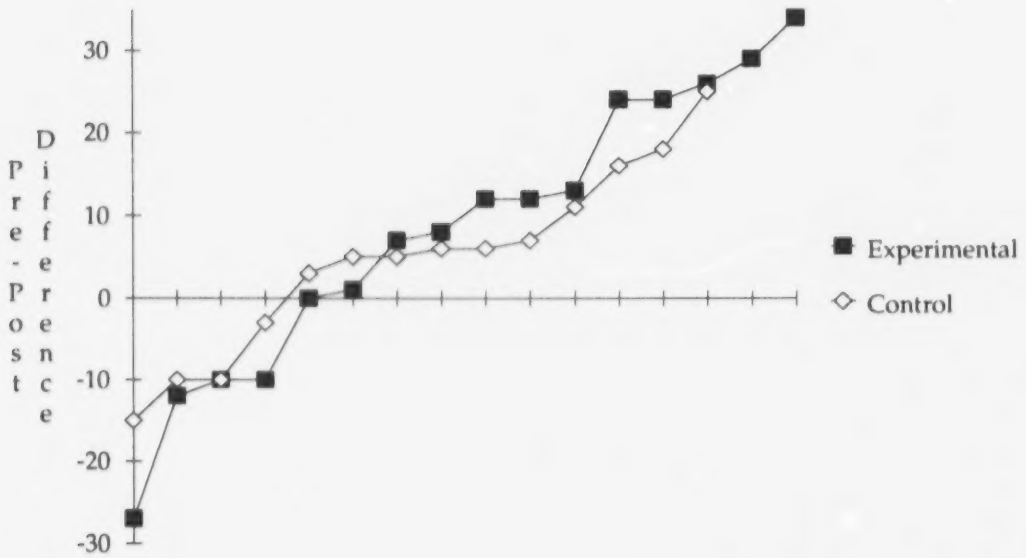


Figure 1. CPT Difference Scores for Students in Experimental And Control Groups

The difference between pre- and post-test scores for the CPT is presented in Figure 1 for students in the experimental and control groups. It is clear from Figure 1 that more students in the experimental group showed greater gains than did those in the control group.

The relationship between number of CSR modules passed and final grades for students in the experimental group is shown in Figure 2. There are more students with a "Progress" grade than with "Satisfactory," "Unsatisfactory," or "Withdrawal" grades. This might be due to

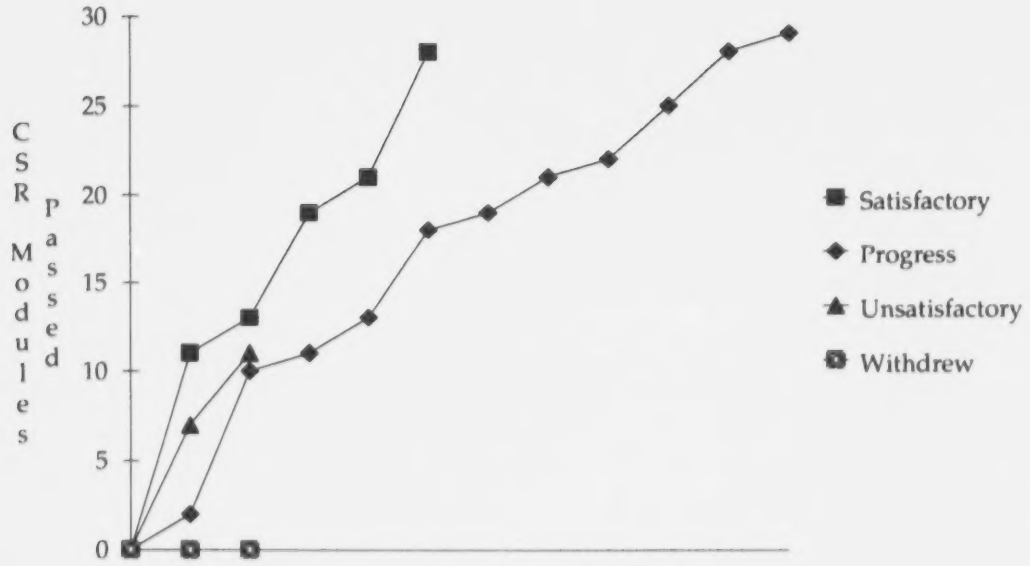


Figure 2. Number of CSR Modules Passed and Final Grade

Table III

Final Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrew*
Experimental Group N=24*	25%	50%	13%	13%
Control Group N=18*	56%	28%	6%	11%

*Due to rounding, the percentages total 101% for each group.

lower entry levels, different learning styles, or the determination of final grades by an in-class essay. Further refinement in the future to address students' differing needs both in the classroom and in the lab should help these students to receive a "Satisfactory" grade.

A comparison of final grades between the experimental and control groups is shown in Table III. The experimental group registered fewer withdrawals. In spite of the lower scores at the beginning of the term, half of the students in the experimental group showed progress. Usually students with learning disabilities and poor scores drop out in greater numbers.

Student Lab Evaluations

At the end of the term, I asked the students in this study to evaluate the strengths and weaknesses of both labs. The following quotations from students capture the feeling of the majority in both groups.

Strengths

College Prep Writing Lab

- a tutor is always there to help me
- has many useful exercises
- it gives me the chance to do my work
- the tutors and the handouts
- independent study
- helps me with grammar

Electronic Classroom

- I could go without making an appointment
- I could stay as long as I wanted
- I could work independently
- topics were covered in detail
- I could test myself...and I got immediate feedback
- the assignments...were what I studied in class
- the student knew what was expected of him
- the computer gave practice questions...and examples
- it made me realize I needed help with my grammar
- I really thought that the lab was fun
- the lab hardly gets crowded
- the assignments are easy to comprehend
- don't have to wait for a tutor to check your work
- the lab is quiet...which makes it easy to focus
- the tutors (lab staff) are very helpful
- the computer didn't get frustrated when I got confused

Weaknesses

College Prep Writing Lab

- too crowded and inconvenient
- the loud noise
- sometimes students have to give up their seats to students who only want to add another hour to their record
- not all the tutors agree with the way your teacher shows you how to do the work
- the lab has limits...the hours are not flexible
- there is not enough equipment for the students
- only allows one tutor appointment per week

Electronic Classroom

- the computer could not talk
- there were not enough instructors
- the essay was not taught
- nobody was there to help me find the right answer

Recommendations

To Faculty

- Make instructions to the students clear. Define what is to be done in both labs.
- Make instructions to tutors and lab staff clear. Recognize their problems and concerns. Recognize their needs and limitations.
- Show an interest in the lab reports. Return them to the students. These lab reports have grades. That motivates the student!
- Always be aware of varying levels and degrees of deficiencies when monitoring lab work and make appropriate changes to accommodate individual needs.

Achieving success in the Electronic Classroom takes time, awareness, and a willingness to experiment and take risks. Teaching in the lab helps to maintain a close connection between class and lab; the two cannot, and should not, be separate.

To CSR

- Provide more flexibility to change the level of difficulty for individual students.
- Provide more tutorials for variety when students fail so they don't feel they are reading the same thing over and over.
- Provide more grammar modules and more variety in Level IV.

Use of Realtime Writer for Writing

Dr. Linda Tixier, Professor of English and Chair of the English Department at Miami-Dade Community College's North Campus, has been concerned about underprepared students for most of her twenty-two years there. Because of training in Gestalt Therapy and Neurolinguistic Programming, Tixier has become interested in learning theory, learning styles and strategies, and behavioral change, especially as applied to verbal, nonverbal, and written communication. She received her B.A. and M.A. in English from the University of Texas in 1961 and 1964 respectively and her Ed.D. in Higher Education Administration in 1977 from Nova University.

Ivonne Lamazares, Assistant Professor of English, has been at Miami-Dade Community College's North Campus English Department since 1984. Her first contact with underprepared students occurred earlier, in 1981, when she began tutoring one-on-one with groups of five to seven students in the Writing Laboratory. Since becoming a full-time faculty member in 1984, she has taught an average of two to three developmental writing sections each semester. She received her B.A. in English from Barry University and her M.S. in TESOL from Florida International University. She is currently working on her Ed.D. dissertation at the University of Miami.

NOTE: In the following co-authored report, paragraphs that refer only to one author or the other are set in italic.

The Setting

About the Course

ENC 1100, *Introduction to English Composition (3 credits)*, is the highest level of remedial writing offered at Miami-Dade Community College. The course objectives focus on the teaching of a standard four- to five-paragraph essay that is sufficiently developed and free of most mechanical errors. At the successful completion of this course, students move to ENC 1101, or college-level freshman composition. To be able to receive a grade of C or higher and move to freshman composition, all ENC 1100 students are required by departmental policy to receive a holistic score of 4 or higher (2 from each rater) in a departmental evaluation of the essays they write in sixty minutes under controlled testing conditions.

About the Students

The students involved in the study are enrolled in ENC 1100. They come to this level by three possible avenues: (1) they have passed previous lower-level developmental writing courses, (2) they have graduated from the ESL program, or (3) they have scored below freshman level in the Multiple Assessment and Placement Services (MAPS) test (score of 30-36). Students are placed in classes through referral from other departments or other programs (such as the Learning Disabilities program) or are enrolled by general college advisors or by self-selection.

In Winter Term 1990 (January-May), of the seventeen students enrolled in Lamazares' Electronic Classroom (EC) course, 60% were Hispanic, 26% African-American, 6% Asian and 6% Haitian.

There were no Anglo-American White students in her course. 73% of the students were non-native speakers of English and exhibited a high degree of second-language syntax and mechanical errors. 47% of all students had come from previous lower-level developmental writing courses. None attended the Learning Disabilities Laboratory, but 50% were referred to the Writing Laboratory for further one-to-one tutoring in grammar and development deficiencies. Only one student reported having no previous experience in using computers. The rest of the students reported having taken computer courses (data processing, word processing, computer languages) in either high school or college. 17% reported having access to a computer at home.

In the class taught by Tixier, eighteen students wrote the departmental examination. 44% had taken previous developmental writing courses, and 39% indicated that they were non-native speakers. Of the eighteen students, 22% were Jamaican, 27% Hispanic, 27% African-American, 11% White Anglo-American, 5% Haitian, 5% Egyptian. Several of the students indicated that they were either familiar with or interested in learning more about computers. Two students indicated some discomfort around computers, but none indicated feeling frightened or intimidated by them. Three students had access to computers other than in class. Observation indicated that none of the students had keyboard skills.

About the Software

See page 7 for a description of the software.

The Design

Our Expectations

We hypothesized that Realtime Writer (RTW) could offer the student and the teacher several advantages. First, the use of this software program could drastically alter the learning environment so that the usual "presentational" mode of teaching/learning would be replaced with a more social model. Students would be encouraged to brainstorm as a group, receiving peer comments and instructor feedback at the moment of composing.

Other advantages would include the fact that underprepared students might find this approach more interesting and might be more willing to participate in this type of dialog than in the verbal dialog commonly experienced in a traditional classroom. Because the focus is on writing, RTW might also help students develop fluency and increase their self-confidence as writers. Their perceptions of the writing course might become more positive, improving student retention rate and performance.

Thus we proposed to investigate whether students using RTW in the EC would (1) improve in retention, (2) become less anxious about writing, and (3) produce writing which demonstrates improved articulation of ideas and which shows evidence of critical thinking.

Training on Using the Software

We were introduced to RTW in a day-and-a-half workshop taught by an out-of-town consultant. This experience was not as valuable as it could have been because the pace of the workshop was, of necessity, rapid. The software was not fully operative during the workshop. Numerous features of RTW were introduced, and we both felt a bit overwhelmed with possibilities.

Subsequently, we spent an average of three to four hours a week for perhaps eight weeks in Fall Term (August-December 1990) practicing with the software, with the help of Project SYNERGY staff members. Toward the end of the semester, we both experienced something akin to panic; neither of us felt expert with RTW and the word processing program, and we both were aware that we had experimented insufficiently with a number of RTW's features. The anxiety and apprehension, however, were mixed with interest in and curiosity about the possible classroom strategies and activities that began to occur to us as we grew more familiar with RTW.

How the Course Was Structured

We taught the same course (ENC 1100, *Introduction to English Composition*), used the same textbook (*College Writing Skills with Readings* by Langan, second edition), assigned

the same number of timed in-class essays, scored the same timed essays with the Camelot *Analysis of Writing* program, and used the same evaluative (writing anxiety) instruments.

Our classes met twice weekly, for one hour and fifteen minutes each. We conducted one class per week in the EC and one in the regularly assigned classroom. All timed in-class essays were written in the regularly assigned classroom, with the exception of the department examination. We used a combination of Realtime Writer and a word processor (*Write* from Microsoft Windows 3.0).

How the Software Use Was Structured

We agreed to experiment with RTW using our different teaching styles, rather than conforming to a preestablished method of instruction. We collaborated not only in writing the proposal, but in training ourselves to use RTW and in planning the course activities. Informal exchanges on what we observed in the classroom continued throughout the study and was one of its most productive and enjoyable features. We also shared and used each other's assignments, a practice that, unfortunately, seems all too rare in a regular teaching setting.

Lamazares structured the use of software by alternating between RTW and Write. Students met approximately ten times in the EC, five sessions using RTW and five using Write, with students spending no more than two consecutive sessions using the same program. This was done to reduce boredom and introduce variety in course activities.

Lamazares used RTW for discussions of reading passages (two or three students grouped on one channel), peer feedback on rough drafts of essays (student pairs using different channels), collaboration on an editing exercise (student pairs using different channels), and discussions of grammatical exercises (all students and teacher on the same channel).

Lamazares had students use the word processing program to compose rough drafts and final drafts of untimed essays for evaluation, and to revise and rewrite essays she returned to students.

Tixier adopted a format, as much as possible, of weekly alternating the use of RTW with the use of the word processing program. When using the word processing program, students were rewriting essays which had already been graded and upon which they had been given feedback or were writing journal entries. During word processing sessions, Tixier would circulate, answer questions, and conference with students individually.

Tasks with RTW varied. Students sometimes worked in small groups of two or three, with each group assigned to a different channel. Tixier would tune into the channels while the students were working and would answer questions or make comments. Sometimes the students ignored Tixier entirely, and sometimes she was unable to get from one channel to another quickly enough to keep up with student questions or requests for feedback.

Toward the end of the semester, Tixier felt brave enough to attempt total group discussion of reading selections on one channel. (Earlier attempts to have the entire class involved in a task on one channel had proved discouraging; students had gotten into verbal sparring and playing and it was difficult to keep them focused on a task.) Students did remain focused during three class discussions on reading selections from the textbook.

Monitoring the Study

Monitoring was done through observations we kept in a weekly journal. Salient points from our journals are summarized in the ***Student Outcomes*** section under ***Our Positive Observations*** (page 38) and ***Our Less Positive Observations*** (page 39).

The study was implemented as proposed with one exception. We decided to use the Camelot *Analysis of Writing* form (see page 47) rather than develop an Evaluation Matrix to assess critical thinking improvement. This change was made for several reasons. First, we were unfamiliar with the Camelot *Analysis of Writing* form when we wrote the proposal, and subsequent examination of this form revealed that most of the areas upon which we desired to give students feedback were included on there. Finally, the severity of students' writing deficiencies indicated that feedback was

necessary in the area of mechanics (not solely critical thinking).

As the study progressed, we felt periodically overwhelmed with the time required to plan and execute the various course activities in the EC. It was frustrating to teach using a new technology with which we were not yet fully comfortable. Notwithstanding these difficulties, we believe that, due to our experience in the EC, we have learned a great deal about what is and is not useful in teaching writing with computers. We have gotten a first-hand understanding of the issues involved in RTW, of some of our strengths and weaknesses in this area, and most of all, we have identified our desire and commitment to use computers to teach writing. Our students' attitudes toward and achievement in the EC have sold us on the potential of using computers with a developmental student population. However, we also hope that in the future not only developmental groups but all composition students at Miami-Dade will have access to computer programs and word processing in their English courses. Moreover, we both hope to contribute to the design and implementation of a computer-assisted English curriculum at Miami-Dade.

Student Outcomes

Our Positive Observations

- Students stayed on task, as evidenced by printed dialogs. They worked on task for the entire class period whether composing, revising, or going over reading selections. They kept writing and revising steadily for the entire class period in the EC. Probably they would not have worked, especially on revising writing, for an entire class period without being on the computer.

- *Students worked well in groups, except two students Tixier had to threaten to take off the network because of their inappropriate comments. For Lamazares, students who went to the EC were much more likely to ask each other (voluntarily) for feedback on papers than would students who did not attend the EC. (Tixier had only one class and it was taught in the EC.)*

- Students never seemed to "catch on" to the fact that they were writing all the time they were in the EC.

- Students reported enjoying themselves. *Tixier's students met in the EC after being escorted there the first time and were almost always on time or early on the days the class met there.*

- *Lamazares noticed that students were writing longer papers on timed essays at the end of the semester. Lamazares believes this is a result of working in the EC. Tixier noticed the same and is not sure if it is the result of the EC or classroom instruction or both.*

- Conferring with students on revision of papers was easier and more effective in the EC because (a) it was possible to see more of the students' papers on the screen, (b) it was possible to make suggestions which students could implement immediately, and (c) it was easier to get around to students because it took less time to read the paper on the screen than in longhand. *(Tixier worked only with students on revising previously graded timed essays and composing journal entries. Lamazares worked with students on composing papers which would later be graded.)*

- From reading the literature (Beil, 1989, p. 26) we both were prepared for democratization and change in locus of control in the classroom. Additionally, we enjoyed the fact that roles were occasionally reversed in that students, some of whom were quite knowledgeable about computers, taught the teachers.

- Students' questions about papers and writing seemed to be more sophisticated and more pertinent at the end of the semester. Students progressed from the general "Is this all right?" or "Is this enough?" to the focused "Does this example relate to the topic?"

- We both observed that students participated more in going over reading/editing exercises on RTW than they did in the regular classroom. More students were involved in offering comments and all were involved in reading everyone else's responses.

Our Less Positive Observations

- A few students in both classes experienced difficulties because they did not have any keyboard skills. They seemed to feel very frustrated, unable to function effectively in the EC. This showed either in lack of work or in excessive errors in their work.

- *Three students in Tixier's class might have been intimidated by the EC. They were frequently absent on the EC days and did not make the time up. They eventually stopped coming to class.*

- Getting in and out of RTW: Despite a handout with directions, students became confused and sometimes got "stuck," having to be rescued by an assistant or an EC administrator.

- Problems associated with the word processing program, *Write*:

    - Students and teacher forgot or got confused about how to perform essential functions such as saving, saving to disk rather than hard drive, opening and closing files, etc.

    - Problems with managing student diskettes and printing arose. It was difficult to get material printed by the end of class without allowing students to print themselves. However, it is not desirable to allow students the option of printing before they are familiar with the system.

    - Students failed to edit papers during the process or just after papers were composed in the word processor.

    - Instructors did not have the time or expertise to teach students anything but the most rudimentary editing techniques in word processing.

- Realtime Writer:

    - Due to lack of expertise and time, it was difficult to perform certain functions such as importing a file, using the Teacher Window, using the Special Teacher Window, and erasing messages from the Special Teacher window.

    - We were largely unable to assimilate, remember or use all the information regarding the various features of RTW given in the training workshop for several reasons: training occurred too far in advance of the time the software was going to be used; a few aspects of RTW were not "up" for hands-on practice during the training workshop; and the training workshop covered too much in one sitting. (It would have been better if the training had been chunked down and included tutorials, practice exercises, mastery of one aspect of RTW before going on to another.)

    - Utilization of RTW with a class requires more time for planning and design of activities (at least initially) than a standard class does; despite the considerable amount of time we devoted to using and practicing with RTW before actual instruction began, we often felt overwhelmed during the semester of implementation.

- Problems due to lack of expertise in teaching with technology:

    - We had a pronounced tendency not to allow students time to learn computer functions (moving the cursor, deleting, saving, working effectively with the mouse), but to reach over and do it for the student because of time constraints.

    - We both experienced pressure because every activity took longer than expected (due to having to instruct students in how to perform various functions on

the computer). Thus, activities occurring in the EC took more time than the same activities in the regular classroom.

- Some detrimental aspects due to loss of teacher control were use of obscene language and derogatory, distracting and insulting comments in dialogs which students wrote on the network (Beil, 1989, p. 35).

Faculty Observations: "I Wonder's..."

- What about student privacy during the process of composing on a computer? Not only the teacher can see what the student is writing, but so can other students.
- What about student privacy in RTW dialogs?
  - Does the teacher interfere with or crowd the flow of the dialog by going into channels when students are working on tasks on different channels?
  - How are students affected by the fact that feedback given to them in RTW is published?
  - Are the dialogs for the teacher to read? Are the dialogs for everyone in the class to read? Should the teacher get students' permission before reading or disseminating student dialogs?
- What about students who are intimidated by or don't like computers and don't realize this until they are actually in a class with computer - assisted instruction?

Student Feedback on Dialogs

[Please see page 45 for a sample dialog.]

Students reported the following:

- They enjoyed sharing opinions with each other (Dialog 4/4/91).
- They learned from their peers (Dialog 4/4/91).
- They learned at the same time that they got to know classmates they had never spoken to before in the classroom (Dialog 4/4/91).
- They improved their writing, grammar, and reading skills (Dialogs 4/4/91, 3/14/91, 3/28/91).
- Every student got to participate in discussions (Dialog 4/4/91) and, while avoiding noise and chaos, saw how others expressed themselves (Dialog 3/7/91).
- They enjoyed RTW discussions and asked to have more RTW Exercises: "Let's do it again next week" was a frequent comment (Dialog 3/14/91).
- They felt that working with others motivated them to get the assignment done and understand the course material (Dialog 3/7/91).
- They were able to appreciate the different views of class members, and most people gave opinions, whereas in the classroom they may have been "sort of shy and scared to be wrong" (Dialog 3/7/91).
- They thought more about the reading passages than they would have at home (Dialog 3/7/91).
- They perceived that RTW taught them how to work together in a group (Dialog 3/7/91).
- They felt RTW saved time in that they were able to see each person's answer to a question and respond to it without interrupting the class (Dialog 3/7/91).

Retention and Pass Rates: English Departmental Essay Examination

We calculated retention rate by comparing the number of students who took the Departmental Essay Examination at the end of the semester with the number of students appearing on the third class roll of the term (2 1/2 weeks into the term). The Departmental Essay Examination is holistically scored by a Florida CLAST (College-

Level Academic Skills Test) model. Each paper is read by two instructors other than the classroom teacher and assigned a score of 1 (lowest) through 4 (highest). Students pass the exam with a minimum combined score of 4 (score of 2 from each reader).

As Table I below shows, for both classes taught in the EC, the retention rate was higher and the failure rate lower than the average of the remainder of the ENC 1100 classes in the English Departmental Essay Examination for Winter Term (January-April 1991).

Writing Improvement: Camelot

The Camelot *Analysis of Writing* program, which gives feedback on thirteen categories of errors in writing, was used with four student timed (sixty-minute) in-class essays on topics previously given in English Departmental Essay Examinations. Of the thirteen categories, four related to development of ideas and nine dealt with mechanical problems.

Development categories included "Main Idea," "Method of Development," "Unity and Coherence," and "Syntax." (Note: "Syntax," interpreted as "word order leading to smooth flow of ideas," is included under development.) Mechanical problem categories included fragments, fused sentences, subject-verb agreement, verb usage, pronouns, punctuation, capitalization, spelling, and diction.

The total number of comments made under the general category of development of ideas was counted on the first essay and compared to the total number of comments counted on the fourth essay, which was also the Departmental Essay Exam. (Note: The Departmental Essay Exam was holistically scored by two other faculty, but we filled out the Camelot feedback forms.)

Likewise, the total number of comments made under the general category of mechanical errors was counted on the first essay and compared to the total number of comments made on the fourth essay (Departmental Essay Exam).

As Table II below shows, overall the number of comments in both categories decreased from the first essay to the last, which would seem to indicate writing improvement, especially in the development of ideas, where the comments decreased more dramatically.

Table I

Comparison of Retention and Pass Rates in ENC 1100

Lamazares:	Retention	83%	Failure rate in dept. exam	13%	n=15
Tixier:	Retention	90%	Failure rate in dept. exam	17%	n=18
All others:	Retention	79%	Failure rate in dept. exam	19%	n=660

Table II

Number of Comments Across Essays

	Development of Ideas		***Mechanical Problems***	
	Essay 1	**Essay 4**	**Essay 1**	**Essay 4**
Lamazares	7	3	42	28
Tixier	29	16	122	105

Table III

Comparison of Holistic Scores of RTW and Other Sections

Holistic Scores	*Realtime Writer Ivonne Lamazares N=15*	*Realtime Writer Linda Tixier N=18*	*Other Sections N=660*
8	0%	6%	<1%
7	13%	6%	2%
6	13%	17%	10%
5	13%	22%	17%
4	47%	33%	52%
2	13%	17%	18%

Holistic Scores in Departmental Essay Exam

During the thirteenth week of the semester, all students registered for English composition courses at Miami-Dade's North Campus wrote a sixty-minute essay on one of two topics given under controlled testing conditions. They went to an auditorium and received instructions from an exam proctor. No students were allowed to use a dictionary or any other class material.

These essays were later scored holistically by two readers trained in the use of holistic scoring and in the use of departmentally agreed-upon scoring criteria for each course level. Range finders (or typical papers) for each score (1, 2, 3, or 4) were identified by table leaders prior to the reading session and then shared and discussed to ensure that all readers were following the same scoring guidelines. Readers were also constantly monitored by table leaders during the reading session to ensure that their reading remained accurate and followed the group consensus. Each reader was not aware of the score that a previous rater had given any particular essay since all scores were coded. Each paper was read twice, and any discrepant readings were brought to a third reader, usually a table leader or a more experienced faculty member. In order to pass the course, all students needed to score 2 from each reader (composite score of 4).

Table III provides a comparison of Departmental Essay Exam holistic scores of our students who used RTW with the scores of students in other sections of ENC 1100. In terms of percentages, more of our students scored in the upper half (composite scores of 6, 7, or 8), and fewer scored in the lower half (composite scores of 2 or 4).

Writing Anxiety

The Writing Apprehension Test, a 26-item instrument (reliability coefficient 0.921) developed by Daly and Miller (1975) was used with both classes. The test measures the degree to which an individual associates writing with fear, anxiety, and failure or with pleasure, satisfaction, and success. The student is asked to agree with, disagree with, or state his/her uncertainty about statements such as "I avoid writing," "I have no fear of my writing being evaluated," etc. (See page 46, for the instrument.) Scores on this test can range from a low of 26 (extremely anxious) to a high of 130 (extremely confident).

Both classes were administered the Writing Apprehension Test during the second and the fourteenth weeks of the semester. The results of the pre- and post-tests are summarized in Figure 1.

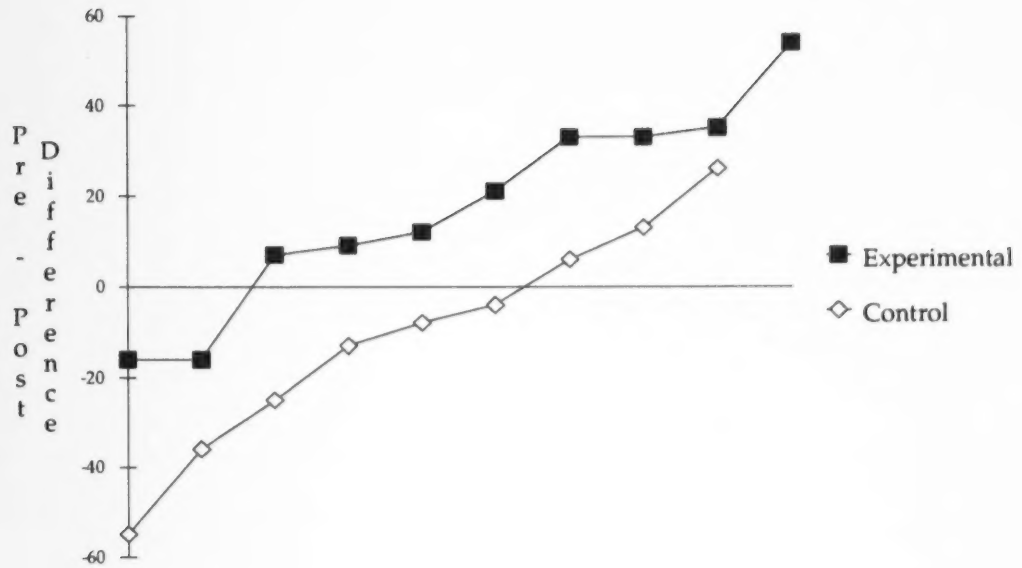


Figure 1. Writing Apprehension Test

Recommendations

- Keyboarding programs are available and should be provided for students whose ability to function is hampered by lack of keyboarding skills.
- Training for students on the computer system needs to be systematic, organized and consistent:
  - Perhaps flow charts should be available in the EC showing students how to access and exit RTW and *Write*.
  - Laminated instruction and/or flip charts need to be available in the EC to show students how to save, print, exit and do other housekeeping functions. This information was provided in handouts which students lost, misplaced or forgot.
  - Faculty need on-going training, mentoring and time for practice, experimentation and planning (two to three times as much as one would originally anticipate).
  - Faculty need to be prepared to completely redesign courses to teach in the EC.
  - Faculty should be invited to attend, observe, or participate in classes already using RTW.
  - Administrators must realize that faculty teaching in the EC need mentoring and additional time for planning course activities and instructional methods.
- In order to promote student learning of the computer system, a "hands off student keyboards" policy should be adopted by instructors and EC staff. Whenever possible, students should be the only ones to execute computer functions at their stations. Instructions should be provided orally to them by faculty and/or EC administrators.

- Some consistent policy regarding printing and storage/availability of diskettes needs to be established as more faculty begin to use the EC.

- The RTW software vendor needs to be aware of inconsistencies and lack of clarity in the RTW manual. The instructions for importing a file and using the Teacher Window and Special Teacher Window especially need to be clarified.

- RTW seems to lend itself for use as a classroom research/feedback instrument. Students can easily give instructors feedback on what they are learning and what they think of the instruction in the course. When we used RTW in this fashion, we received very useful feedback on our teaching and course activities in this study. It is advisable that future faculty teaching in the EC consider using RTW as a tool for classroom research.

- Due to the enthusiastic reception of the EC and RTW by both faculty and students (despite some time constraints and lack of training), and due to the positive retention and anxiety and writing improvement results obtained in this study, we believe that RTW is a very useful tool for the teaching of writing to a developmental student population. It should be made available to as many developmental writing students as possible, and faculty training in the use of the software should be continued and expanded.

Bibliography

Beil, Donald H. "Realtime Writer: A Description of One Product Supporting ENFI" in Donald H. Beil (Ed) *Teacher's Guide to Using Computer Networks for Writer Interaction,* Realtime Learning Systems, Washington, D.C. (1989), pp 13-28.

Beil, Donald H. "Quick-Start Summary: Advice, Tips, and Techniques for Users of ENFI Systems" in Donald H. Beil (Ed) *Teacher's Guide to Using Computer Networks for Writer Interaction,* Realtime Learning Systems, Washington, D.C. (1989), pp 29-37.

RTW Sample Dialog

04/04	08:54:47	Yadary	I really like this exercise because we shared opinions
04/04	08:54:48	Holiday	This is a lot of fun. We learn and at the same time we get to have fun communicating with our friends. This is also good because their is people in our classroom which I have never spoke to, and threw this program I did
04/04	08:54:54	Elizabet	I think it was interesting, because we all had a chance to do the work together. It was lots of fun. We learned and had fun at the same time. Hopefully we'll do it again.
04/04	08:54:55	Aimee	Or should I have said It is very helpful
04/04	08:54:57	Vicente	Yes this is interesting I think we should do it more after.
04/04	08:55:08	Judith	Thanks Tanelia for that nice comment!!!
04/04	08:55:09	Hao	The exercise helps us improve our grammar skills and writing methods.
04/04	08:55:17	Tanelia	Next time pay attention Vicente.
04/04	08:55:24	Holiday	Yea Vicente you have done so much work today.
04/04	08:55:25	Yadary	Hao look what Vicente is saying.
04/04	08:55:27	Aimee	When we don't have more time Vicente.
04/04	08:55:31	Travis	I think that this exercise was very interesting I enjoyed communications to other students in my class. I think that this exercise help students to become more acquainted with one another. Thank you Ivonne for this exercise I really learned a lot about other students in my class.
04/04	08:51:49	Leonardo	Them
04/04	08:51:56	Ivonne	Which is the subject?
04/04	08:51:57	Aimee	Her
04/04	08:51:58	Vicente	Parrot. that what I ate.
04/04	08:51:58	Reynold	Her
04/04	08:52:07	Leonardo	Anyone
04/04	08:52:13	Aimee	So is her
04/04	08:52:18	Ivonne	Is that singular or plural?
04/04	08:52:25	Ivonne	Anyone is ...
04/04	08:52:27	Aimee	Singular
04/04	08:52:32	Leonardo	Plural
04/04	08:52:35	Ivonne	Ok, so it should be "her."
04/04	08:52:38	Travis	Singular
04/04	08:52:40	Aimee	No singular
04/04	08:52:44	Ivonne	Anyone is singular. Only one person.
04/04	08:52:50	Aimee	Right
04/04	08:52:55	Holiday	Yea that could be it you are taking so much this morning that me tienes mariada.
04/04	08:54:06	Leonardo	Great learning experience.
04/04	08:54:16	Lisagail	It was ok yes I think this is a good thing to do.
04/04	08:54:19	Aimee	I think it was very good. It helps a lot.
04/04	08:54:26	Judith	I think this was a great exercise, and we should do it over. It was very nice communicating with Holiday.
04/04	08:54:30	Tanelia	This exercise seem to have gotten more participation from all the people in the class. I feel that we can do this again with all jokes aside.

Writing Apprehension Test

Directions: Below are a series of statements about writing. There are no right or wrong answers to these statements. Please indicate the degree to which each statement applies to you by circling whether you

(1) Strongly agree, (2) Agree, (3) Are not sure, (4) Disagree, (5) Strongly disagree

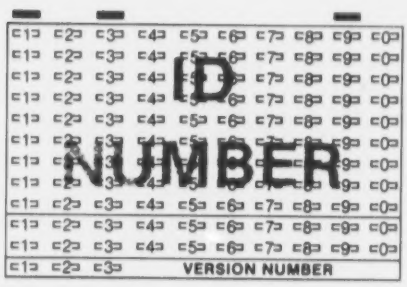
with the statement. While some of the statements may seem repetitious, please take your time and try to be as honest as possible. Thank you for your cooperation.

1.	I avoid writing.	1	2	3	4	5
2.	I have no fear of my writing being evaluated.	1	2	3	4	5
3.	I look forward to writing down my ideas.	1	2	3	4	5
4.	I am afraid of writing essays when I know they will be evaluated.	1	2	3	4	5
5.	Taking a composition course is a very frightening experience.	1	2	3	4	5
6.	Handing in a composition makes me feel good.	1	2	3	4	5
7.	My mind seems to go blank when I start to work on a composition.	1	2	3	4	5
8.	Expressing ideas through writing seems to be a waste of time.	1	2	3	4	5
9.	I would enjoy submitting my writing to magazines for evaluation.	1	2	3	4	5
10.	I like to write my ideas down.	1	2	3	4	5
11.	I feel confident in my ability to clearly express my ideas in writing.	1	2	3	4	5
12.	I like to have my friends read what I have written.	1	2	3	4	5
13.	I'm nervous about writing.	1	2	3	4	5
14.	People seem to enjoy what I write.	1	2	3	4	5
15	I enjoy writing.	1	2	3	4	5
16.	I never seem to be able to clearly write down my ideas.	1	2	3	4	5
17.	Writing is a lot of fun.	1	2	3	4	5
18.	I expect to do poorly in composition classes even before I enter them.	1	2	3	4	5
19.	I like seeing my thoughts on paper.	1	2	3	4	5
20.	Discussing my writing with others is an enjoyable experience.	1	2	3	4	5
21.	I have a terrible time organizing my ideas in a composition course.	1	2	3	4	5
22.	When I hand in a composition, I know I'm going to do poorly.	1	2	3	4	5
23.	It's easy for me to write good compositions.					
24.	I don't think I write as well as most other people.					
25.	I don't like my compositions to be evaluated.	1	2	3	4	5
26.	I'm no good at writing.	1	2	3	4	5

Camelot *Analysis of Writing* Form-Level A

SCAN-TRON ® FORM NO. 2960-MDC

FEED THIS DIRECTION



ACTIVITY NUMBER

NAME: _____

I.D. NUMBER: _____

COURSE: _____

DATE: _____

IMPORTANT:

- USE NO. 2 PENCIL
- EXAMPLE: ⊏1⊐ ⊏2⊐ ◄■► ⊏4⊐ ⊏5⊐
- ERASE COMPLETELY TO CHANGE

CAMELOT

TYPE 5 FORM

WRITING — LEVEL A

	SKILL AREA	CLASSIFICATION WITHIN SKILL AREA
—	1. LEVEL OF PRESCRIPTION	Level A (IT IS NOT NECESSARY TO BUBBLE THE LEVEL ON THIS SHEET. THE FORM IS MEANT ONLY FOR LEVEL A)
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	2. POSITIVE REINFORCEMENT	**1. Content shows promise — original, creative, interesting 2. Well organized 3. Few mechanical errors 4. Encouragement for continued effort 5. Overall good paper — 1,2,3 combined**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	3. FRAGMENT	1. Dependent or subordinate clause used as a sentence 2. Verbal phrase used as a sentence 3. Omission of subject or verb
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	4. FUSED SENTENCE	**1. Comma splice — misuse of comma between sentences 2. Run-on**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	5. SUBJECT / VERB AGREEMENT	1. Singular subject / plural verb, plural subject / singular verb
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	6. VERB USAGE	**1. Shift in tense 2. Curtailed verb — omission of "ed" ending 3. Misuse of principal parts of irregular verbs 4. Misuse of principal parts of irregular verb "to be"**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	7. PRONOUN	1. Vague reference 2. Misuse of reflexive / intensive pronoun 3. Shift 4. Misuse of nominative and objective cases
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	8. PUNCTUATION	**1. Omission of end punctuation 2. Misuse of comma 3. Misuse or omission of apostrophe for possession 4. Misuse or omission of apostrophe in contractions**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	9. CAPITALIZATION	1. Lack of capitalization 2. Misuse of capitalization
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	10. SPELLING	**1. Rule-related errors 2. Errors related to mispronunciation 3. Incorrect separations or combinations of words**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	11. DICTION	1. Meaning not clear 2. Invented words 3. Too informal 4. Incorrect formation of noun plurals 5. Commonly confused words
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	12. SYNTAX	**1. Interrogatives 2. Negatives 3. Adverbial modifiers**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	13. UNITY AND COHERENCE	1. Lack of transition(s) 2. Lack of consistent ordering of general and specific ideas 3. Digression(s) 4. Lack of time order 5. Spatial description lacks order
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏3⊐	14. METHOD OF DEVELOPMENT	**1. Inadequate use of examples, illustrations 2. Inadequate use of reasons 3. Inadequate use of steps in a process 4. Inadequate use of comparison / contrast 5. Inadequate use of details, facts, statistics**
⊏1⊐ ⊏2⊐ ⊏3⊐ ⊏4⊐ ⊏5⊐	15. CENTRAL / MAIN IDEA	1. Too broad for development 2. Lack of central / main idea 3. Unanswered question(s) 4. Lack of attitude, position, opinion

55

BEST COPY AVAILABLE

Use of PLATO for Math

Bill Hajdukiewicz has taught at Miami-Dade Community College for twenty-two years, twelve years in Community College Studies and ten in Developmental Studies. He received his B.S. in Science Education from Clarion University in 1956 and his M.A. in Education from Mississippi State University in 1964.

The Setting

About the Course

MAT 0003 (*College Preparatory Arithmetic*) is the lowest level of two College Prep math courses. A four-credit course that does not count toward graduation, it consists of forty-eight hours of classroom study and thirty-two hours in the Math Lab. Classroom work involves lectures with student participation. The Math Lab provides tutorial help, video and audio tapes, and tutorial computer software. The textbook is Barker, Rogers, and Van Dyke's ***Arithmetic*** (Saunders Publishing Co., 4th ed.). Areas of study include whole numbers, primes and multiples, fractions and mixed numbers, decimals, ratio and proportions, percents. Students take six unit tests for each topic plus a final exam; they must score at least 70% to be classified as competent for any given assignment or test. Students are given a chance to make up any test that they miss or fail. Final grades are recorded as S (Satisfactory, student passes), P (Progress, but course must be repeated) and U (Unsatisfactory, course must be repeated and grade is averaged as an F).

About the Students

The State of Florida requires the first-time-in-college student to take an entry-level placement examination. At Miami-Dade Community College, the Multiple Assessment and Placement Services (MAPS) test is used to meet state requirements. The student with a MAPS raw score between 0 and 24 is required to start his or her math program with MAT 0003, *College Preparatory Arithmetic*.

About the Software

PLATO refers to its learning modules as **Routing Activities**. Please see page 8 for a description of PLATO. Following is an example, in two parts, of the Routing Activities for "Whole Numbers". Each module consisted of tutorial, drill and practice, and two to four tests.

WHOLE NUMBERS (Part 1)
Routing Activity

PLATO Ref.	Module Title
bbmld	Whole Numbers 10-99
bbmle	Whole Numbers 100-999
bbmlf	Numbers 10-999 Review
bbmlg	Hundreds & Thousands
bbmlh	Millions, Billions, Trillions
bbm2a	Meaning of Addition
bbm2e	Addition Skills 1
bbm2f	Addition Skills 2
bbm2g	Addition Skills 3
bbm2h	Addition Skills 4
bbm3a	Meaning of Subtraction
bbm3b	Subtraction Facts
bbm3c	Subtraction Skills 1
bbm3d	Subtraction Skills 2
bbm3e	Subtraction Skills 3
bbm3f	Subtraction Skills 4
bbm3g	Subtraction Review
bbm3h	Problem Solving 1
bbm4a	Meaning of Multiplication
bbm4f	Multiplication Skills 1
bbm4g	Multiplication Skills 2

WHOLE NUMBERS (Part 2)
Routing Activity

PLATO Ref.	Module Title
bbm4h	Multiplication Skills 3
bbm4i	Multiplication Skills 4
bbm4j	Multiplication Review I
bbm4k	Multiplication Skills 5
bbm4l	Multiplication Skills 6
bbm4n	Multiplication Review II
bbm4o	Problem Solving 2
bbm5a	Meaning of Division
bbm5b	Division Facts
bbm5c	Division Skills 1
bbm5d	Division Skills 2
bbm5e	Division Skills 3
bbm5f	Division Review I
bbm5g	Division Skills 4
bbm5h	Division Skills 5
bbm5i	Division Skills 6
bbm5j	Division Skills 7
bbm5k	Division Skills 8
bbm5l	Division Review II
bbm5m	Problem Solving 3
hm6c	Mean, Median, Mode

The Design

It was my intention to administer the departmental diagnostic test at the beginning of the term to all my five sections of MAT 0003, identify those students who scored 28% or lower, place them in a separate section, and let them use the PLATO software in the Electronic Classroom. However, due to delays in administering the test, I was unable to create a separate PLATO class. Consequently, based on the departmental test, the fifty-seven students scoring 28% or lower were considered eligible for the PLATO math program. All were introduced to PLATO's program after which the thirty-one students who chose to stay with PLATO were designated as the experimental group, and the twenty-six students who preferred the regular Math Lab were designated as the control group.

Students gave a variety of reasons for not participating in the PLATO math program: I like the Math Lab better than working with computers. I don't like working with computers; they scare me. My schedule prevents me from getting to the Electronic Classroom. Computers confuse me. I feel more comfortable in the Math Lab. The PLATO math program is not correlated with the text. The Math Lab seems to have a better program for my problems.

Monitoring the Study

The management system of PLATO provides a useful report of students' time on task and their progress. This report helped me monitor my students. Table I represents the kind of information a faculty member will see in a report.

Table I

Students' Progress in Seven Routing Activities and Time on Task

Students	*Finished*	*Started*	*No Work*	*Time Hrs:Mins*
Student 1	7	0	0	60:23
Student 2	0	1	6	0:31
Student 3	0	2	4	0:51
Student 4	4	1	2	11:41
Student 5	7	0	0	12:58
Student 6	0	5	2	8:53
Student 7	3	4	0	11:40
Student 8	0	3	4	3:00
Student 9	0	3	0	0:51
Student 10	1	6	0	18:26
Student 11	1	5	1	21:58
Student 12	2	3	2	22:03
Student 13	7	0	0	60:15
Student 14	1	3	3	49:03
Student 15	7	0	0	23:29
Student 16	2	4	1	24:24
Student 17	4	2	1	21:05
Student 18	0	3	4	2:05
Student 19	1	5	1	7:10
Student 20	0	2	5	4:51
Student 21	0	1	6	1:33
Student 22	0	5	2	13:21
Student 23	1	0	6	2:05
Student 24	7	0	0	13:47
Student 25	1	5	1	21:53
Student 26	1	6	0	13:04
Student 27	1	3	3	25:58
Student 28	0	6	1	35:55
Student 29	0	1	6	1:46
Student 30	0	1	6	3:37
Student 31	1	0	6	6:41

Table II

Gain Scores in Pre and Post Departmental Tests

Range of Gain Scores (in percentage points)	*Experimental Group N=23*	*Control Group N=18*
Up to 30	26%	44%
30 or more	74%	56%

Table III

Final Grade Distribution

Grade	*Experimental N=31*	*Control N=26*
Satisfactory	55%	38%
Progress	19%	12%
Unsatisfactory	16%	19%
Withdrew	10%	31%

Student Outcomes

All the students were administered departmental tests at the beginning and end of the term. The gain scores between pre- and post-tests for the experimental and control groups are presented in Table II.

Based on the scores on the departmental final exams, the students' grade distribution for the experimental and control groups is shown in Table III as follows.

Recommendations

I would like to share with others one of my discoveries about software: it is far too easy and simplistic to look at materials and make quick judgments about them. I can judge the content of the materials, but the reactions of students can only be determined by watching students use them. For example, I was not convinced that the PLATO program's elf-like creature, Clever, giving continual positive reinforcement, was useful; I even mentioned this reservation to staff. However, when I tried the materials the students found Clever to be an important component of the program. They used terms such as "nifty," "great," "cute," "very nice," and "very good" to describe their reactions to Clever. *The moral:* don't make judgements too quickly.

One of my fondest (but perhaps most unrealistic) hopes for the project was that the PLATO program would be of greatest help to those students who needed math remediation the most, my poorest students. To some extent, the results realized the hope and concern that I had: there were more students getting a passing grade who used PLATO than those who did not received; not as many students failed or withdrew from the course. At the same time, many of the students who participated in the project did not complete all the modules scheduled for them; in fact, the completion rate was disappointing. A question for future research might involve working with students to help them complete more modules.

My only real disappointment with the results was that four of my poorest math students were unable to use the PLATO materials to their advantage; they spent many hours in the Electronic Lab with no improvement to show for it. My disappointment is ameliorated by the

knowledge that at least twelve years of previous education was unsuccessful as well with those students.

On the other hand, students liked working with PLATO modules, described PLATO as their personal tutor who was patient and kept them on track. Since they would like to spend more time in the Electronic Classroom, they suggested that the EC hours should be extended to cover evenings and weekends.

Other specific observations/recommendations I have are as follows:

- The math department diagnostic test and exit test identified the students' progress adequately.
- A better first-day introduction to PLATO should be given (for example, an overhead projector showing the keyboard, what you see on the screen, and what actions the student should take next).
- A printout should be given to students showing them the major modules to be covered, the topics for each major module, and explanations of how they should handle the activities for each topic.
- Students should be given the opportunity to start working in the Electronic Classroom as soon as possible.
- There needs to be better communication between the Electronic Classroom staff and the instructor by means of weekly or daily meetings.

Use of CSR for Math

The very first group of entering freshmen in 1960 at Miami Dade Junior College was greeted by Carl Babski. He has taught chemistry, physical science, physics, and mathematics, with the common thread in all these subjects being the underprepared student. He received his B.S. and M.S. degrees from the School of Arts and Sciences at Florida State University and his doctorate with the assistance of the National Science Foundation Grants from Nova University in Curriculum and Instruction.

The Setting

My concern has been: "Will the computer enable students to graduate with more learning than they would achieve without it?" Most comparative studies involving computer-assisted instruction (such as drill and practice, simulation, and tutorial) and traditional lecture methods have generally shown the superiority of CAI (Kulik and Kulik, 1986). Our Project SYNERGY task has been to observe the particular software vectored for underprepared students. This software is mainly structured on manipulation techniques.

Power On! New Tools for Teaching and Learning (1988), a report completed by the U.S. Office of Technology Assessment, and Gagne (1977), Park (1983), and Halff (1986), propagated my interest in the hypothetical role of teachers, learners, and technology into the next decade.

To summarize, this institution must maintain an innovative and professional image. The faculty, including me, are concerned with the quality of teaching, our professional and institutional images, our budgets and sources of funding, and ways to economically increase productivity on campus. The computer technology may be the catalyst for both faculty and students to increase productivity in teaching and learning.

About the Course

Experimental Group. The lecture followed a pattern of instruction as follows: (a) short demonstration of objectives; (b) practice problems completed by students and teacher; (c) discussion and questions; (d) assigned problems to be completed as classwork; and (e) homework to be completed outside of the class. Classwork was checked each lecture; the experimental group had only about six checked classworks. Great effort and time were devoted to the practice problems and time expired before the completion of the classwork each lecture.

Control Group. The lecture followed the same system as in the experimental group, but classwork problems were checked twenty-four times, and this group was required to complete thirty-two hours in the Math Lab. Both groups completed four classroom tests and a cumulative final.

About the Students

The students in both groups were ethnically and racially mixed: African-American, Chilean, Puerto Rican, Cuban, Caucasian, and Asian. The youngest was eighteen and the oldest was fifty. Students enrolled in MAT 0024 have obtained a score below 206 on the Multiple Assessment and Placement Services (MAPS) test.

About the Software

Beginning with a one-day introduction session given by Computer Systems Research, Inc. personnel, I spent two weeks studying the CSR *Basic Skills Curriculum* course listing and then matching CSR modules with sections of the textbook. I added to the course content one extra section from each chapter (e.g., ratio and proportion) that was simple and appropriate. Please see page 8 for a description of CSR.

The Design

The software and the orientation sessions by Kamala Anandam were the guiding light that assisted me in structuring the initial proposal. Colleagues at the college gave supportive input and some basic ideas in structuring the additional sections.

Personalizing the study was limited to aligning the CSR modules with the contents of the textbook However, borrowing from Bloom's instructional model (1980), I decided that if the most effective learning conditions could reduce the amount of time required to learn a subject to mastery, then perhaps, if this software were effective, less time would be needed to complete the material, thereby allowing the course content to be expanded. I added one new section to almost every chapter, as well as five sections to the end of the sections mandated by the college. Placing these five sections at the end of the course allowed me to be flexible with the course content and gave me the choice to use or not to use them.

Two sections of Mat 0024 were selected randomly to observe if CSR, with normal classroom instruction, can help students to improve their performance in math and help the teacher to expand the course content. Testing was also planned to determine if a computer-modularized course could produce a more positive attitude toward math. The control group (starting with thirty-six students) was scheduled to use the Math Lab, while the experimental group (starting with thirty-four students) was set up to use the CSR software in the Electronic Classroom.

I hypothesized that the experimental and control groups would show no significant difference in their levels of achievement, their course grade averages, or their pre- and post-test attitudes toward math. Several assumptions were inherent here: the sample was representative of the Miami-Dade student population taking *College Preparatory Algebra* (Mat 0024); the instructor was unbiased in his attitude toward either method of instruction; all testing was not being affected by the "halo effect"; and the additional sections of content added to the course would be a realistic, achievable goal for our students.

Monitoring the Study

The Electronic Classroom produced a weekly report to the student detailing modules completed, time spent, and grade achieved. The syllabus informed the student of the modules that needed to be completed for each test. Informal personal conversation with the students was the prime source of information gathering in the lab and lecture.

In the beginning weeks, I altered the presentation of lecture material with the experimental group. More time was devoted to illustrating the objectives of each section and manipulating the algebra. I also introduced the constant of re-testing. The experimental group was not at peak performance. Thus, the option to improve test scores, made available after the second test, was used for motivation and a better grade. Only after the third test and after much encouragement did students take advantage of this option. Both groups could re-take the prescribed four tests.

My participation was increased by inviting students to bring questions or problems to the Physics Lab. Six hours a week they could receive assistance; no more than two students a week appeared. Ten office hours a week were also available; no more than three students a week appeared. "We go to work in the afternoon" was the common response of students who did not come into the lab. "I work all night" was the reply when a student was invited to a help session at seven in the morning.

As the study progressed, I made several observations.

- Students were enthusiastic at the beginning and then the enthusiasm declined.
- Students were not completing the required modules for a certain test. To motivate them, it was suggested that, if they completed the modules required in CSR for this course, they could take the final and

complete the course. No student met this challenge early.

- The experimental group needed a great deal of encouragement and time.
- Some students asked to repeat certain modules in CSR for review even though they had passed them earlier. This required either re-registering the students or deleting the existing records for these students for these modules.
- The experimental group was spending less time in the lab than the control group.

Student Outcomes

CSR Modules Passed. The relationship of CSR modules passed and grade is illustrated in Figure 1. The students who passed a greater number of CSR modules received a better grade. There were some who passed some modules and still withdrew from the course.

Grades Comparison. The comparison of the grade distribution for the experimental and groups is shown in Table 1. Once again, the alarming number of students withdrawing from the course in the experimental group is quite a concern. In the future it would be wise to examine the CSR reports carefully at the beginning of a semester and provide some sort of human support to help those students stay with the course.

Computerized Placement Tests (CPTs). The CPTs distributed by the College Board were used to assess the impact of instruction. There were twelve students in the experimental group and twenty-two in the control who took both the pre- and post- tests. Simple gain/loss graphs for the control and experimental groups are presented in Figure 2. The horizontal line represents the students; the vertical line is the gain/loss line. The graph for the control group shows that one student registered a gain of 45, while the graph for the experimental group shows 25 as the maximum registered. A comparison of the groups by a t test procedure yielded no significant difference between the two groups on the CPT pre- and post- tests.

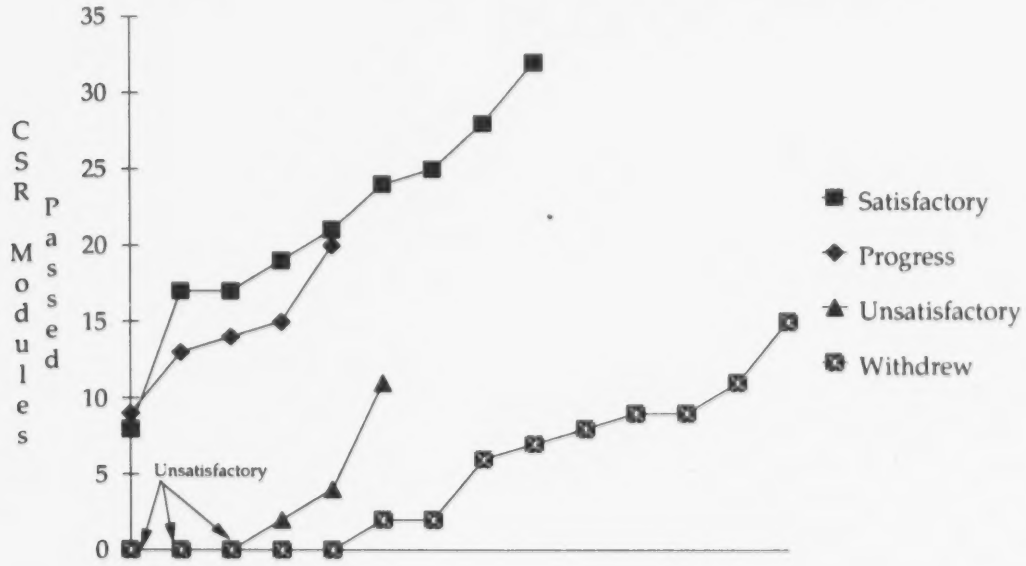


Figure 1. Number of CSR Modules Passed and Final Grade

Table I

Final Grade Distribution

Group/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrew*
Experimental N=34	26%	15%	18%	41%
Control N=36	44%	14%	28%	14%

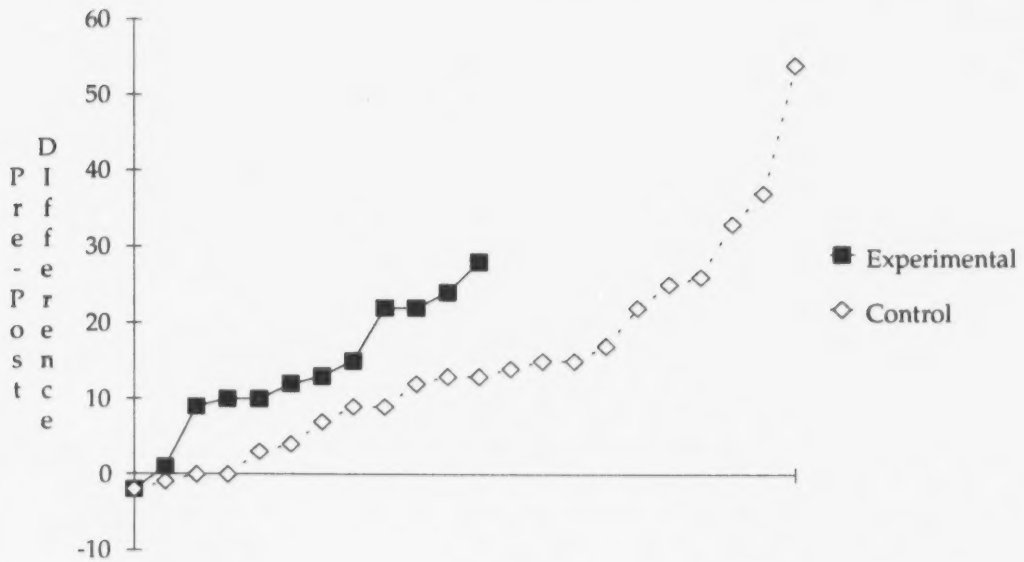


Figure 2. CPT Gain Scores Of Experimental And Control Groups

Recommendations

Department and Administrators. What my experience with research projects has revealed is that "trying harder" and "spending more money" are not particularly relevant to improving teaching in college classrooms. What faculty members need is administrative support, release time to accomplish the task, help (expert) with materials and sometimes from people, flexibility in scheduling classes, some financial support, and team effort. Did we have these ingredients in this project? Affirmative! We had each element in the list.

Recommendations are in a number of areas. For selected persons who can work as a team but handle independent responsibilities, I recommend a team effort in the future: one person to do the teaching and one to do the testing and reporting.

The question of who is to make what decisions for whom probably is the most pressing educational question both today and tomorrow. Today, I would recommend that we get in the boat and not stand on the shore waving to the others going forward with the Electronic Classroom. The particular software of CSR fell short in certain expectations. The modules did not match the textbook; they did not cover all the subject matter that we incorporate in our course, and not all modules would please every teacher in terms of presentation. I would recommend that, if possible, we select our modules from the market and create the course.

Our talents are probably within the realm of marketing the entire package. With the help of a publisher, we could have a book within a year's time.

However, there are many alternatives to this approach. A library of "software text" could be created in a math lab and the student could, with guidance, select the modules to complete the course. Last of the alternates would be to work with the CSR publisher to correct and augment the modules if this is acceptable to the faculty.

Colleagues. To the faculty I would say, "Get involved." This may not be the final form of the panacea, but it may develop into an elixir or quintessence to the finale. Problems may develop, but only by looking at the problems can we conclude what decision is possible and correct our situation.

Students. For students who participated, their experience with the computer has been an element in their growth pattern. To those who have yet to yield to the call, I can only say, "Hello, and welcome to a new experience that should prove vital to your education. Be a part of it!"

Bibliography

Gagne, R. and Brigs, L. ***Principles of Instruction*** Design. New York: Holt, Reinhardt, and Winston, 1977.

Halff, H.M. ***Curriculum and Instruction in Automated Tutors.*** San Antonio, Texas: AFHRL, Workshop on Intelligent Tutoring System, 1986.

Kulik, C.L.C. and Kulik, J.A. "Effectiveness of Computer-Based Education in Colleges," ***AEDS Journal,*** 19, (1986), 2-3.

Park, O. and Tennyson, R.D. "Computer-Based Instruction System for Adaptive Education," ***Contemporary Education Review,*** 2, (1983), 121-135.

U.S. Congress, Office of Technology Assessment. ***Power On! New Tools for Teaching and Learning.*** Washington, D.C.: U.S. Government Printing Office, September 1988.

Using CSR for Math

Don Orr is an instructor of mathematics in his second year at Miami-Dade. He holds a B.A. in philosophy (University of Wyoming, 1974) and an M.S. in pure mathematics (University of Wyoming, 1987). He was honored in 1987 as an Outstanding Graduate Teaching Assistant at the University of Wyoming, where his duties included teaching mathematics to underprepared students. His full-time teaching career began in 1987 at the North Campus of Palm Beach Community College. Although he teaches all levels of mathematics offered at the college at present, he has continued to be involved with underprepared students.

The Setting

About the Course

Elementary Algebra (MAT 0024) covers operations on integers and rational numbers, methods for solving linear equations in one variable, properties of exponents, and operations on polynomials, with emphasis on factoring. The course carries institutional credit only (i.e., does not count toward graduation) and is recommended for students whose placement scores indicate a lack of readiness for intermediate college algebra.

The students' progress is assessed by means of four free-response exams administered at regular intervals. For the current study, these exams were extracted from the instructor's resource manual that accompanies the course textbook (Charles P. McKeague, *Beginning Algebra: A Text/Workbook*, 3d ed., Harcourt Brace Jovanovich, 1990). Also, the students were given a final examination prepared by a committee of math faculty. All students who scored at least 60% on the final and averaged at least 70% on all five exams qualified for a Satisfactory (S) grade. Students averaging at least 55% on all the exams were eligible for a Progress (P) grade; those averaging below 55%, an Unsatisfactory (U) grade.

In addition to the above, all students in MAT 0024 were required to spend a minimum of thirty-two hours in the Math Lab, where they had access to tutoring by students and faculty, as well as to videotapes and software pertinent to the course material.

About the Students

Participating in the study were students from two sections of MAT 0024, one populated by younger students, most of whom attended school full-time, the other primarily by older students who attended school part-time and held full-time jobs.

About the Software

The CSR software has five levels. Please see page 8 for a description of CSR. A review of the complete list of modules revealed that most addressed arithmetic and geometry skills that either were prerequisites for MAT 0024 or were peripheral to the course. Although some modules were selected from Level III to help the students review basic skills, the majority of those judged relevant to the course were found in Level V. Following is a list of the CSR modules selected for the first segment of MAT 0024 (the course had a total of four segments similarly organized). The section numbers refer to the textbook sections where each topic is covered. The titles listed are for the CSR modules. The course included a considerable number of topics for which no corresponding CSR modules existed.

Book Section	CSR Module	CSR Title
1.1	M1315	Understanding order of operations
1.3/1.4	M1311	Working with signed numbers
1.6/1.7	M0867	Multiplying proper fractions
1.6/1.7	M0868	Multiplying proper fractions by whole numbers
1.9	M0563	Adding proper fractions with like denominators
1.9	M0564	Subtracting proper fractions with like denominators
1.9	M0828A	Finding equivalent forms of fractions
1.9	M0828B	Finding lowest-term equivalent fractions
1.9	M0865	Adding proper fractions with unlike denominators
1.9	M0866	Subtracting proper fractions with unlike denominators

The Design

The experimental group was selected at random from names appearing on the preliminary class rosters, sixteen names from each roster. All students not selected for membership in the experimental group were automatically assigned to the control group. Any student who did not attend class at least twice was subsequently deleted from the respective group; the class size was twenty-five in the experimental group and thirty-six in the control group. It was deemed necessary to place late-registering students in the control group since they were unable to participate in the group orientation to the CSR software.

Students in both the experimental and control groups were subject to precisely the same conditions, with one exception: those in the experimental group were given the option to use CSR software, while those in the control group were not. An essential feature of the study was that members of the experimental group were not required to use the CSR software. They were, of course, informed of the thirty-two-hour lab requirement and were told that any time they spent using CSR would be applied toward that requirement.

A primary purpose of the study was to assess the extent to which the students would *choose* to take advantage of computer-assisted instruction if given the *option*. It should be emphasized that the students were encouraged to visit the Electronic Classroom on a regular basis and were reminded that any portion of the thirty-two hours not spent in the Electronic Classroom would have to be spent in the Math Lab.

During the second week of classes students in the experimental section were introduced to CSR as a group in the Electronic Classroom and were given a list of the CSR modules that would be available to them. They were encouraged to complete each module as soon as possible after the corresponding section of the textbook had been presented in class. Also, it was suggested that they use CSR to test and, if need be, to augment their understanding of the course material prior to the time they were tested over that material in class.

Since students in the experimental group sat in the same classes with students from the control group, they all proceeded through the course at the same pace, with exam dates scheduled in advance. As soon as the first exam had been administered, all students in the experimental group (whether they had completed the modules in segment 1 or not) were registered for the nine modules in segment 2. This pattern was continued until all four course segments had been completed. The rationale behind this design was to ensure that all work done with CSR would be relevant to material currently being covered in class. For those students who fell behind in their work with CSR, it was deemed inappropriate to force them to work through a list of "old" modules covering material on which they had already been tested.

Monitoring the Study

The raw data describing the extent to which CSR was used by students in the experimental group appear in Tables I and II. The data in Table I apply to students who completed the

course, the data in Table II to those who either formally withdrew or abandoned the course prior to its completion. Test scores and final grades appear near the bottom of the tables.

Please note that the numbers appearing in the ***use*** matrix in Tables I and II do not indicate the number of times a student attempted each module. Rather, they are intended to measure, as the key shows, the amount of "benefit" derived by the student.

The raw data of Tables I and II are summarized in Table III according to students' use of CSR in each of the four course segments. Additionally, those who made extensive use of CSR during each segment have been subdivided into two categories: "gain" and "no gain." In this context, "extensive use" means that the student completed over half of the modules for that segment, and "gain" simply means that the student had the experience of passing a post-test (after failing the pre-test and going through the tutorial) in at least 20% of the modules for that segment. Thus, a student who "gained" (from CSR's perspective) may or may not have learned from the experience, and such a student did not necessarily perform well on the corresponding test in class. The best example is student #12 for segment 2. Additional examples include students #13 and #14 for segment 1, as well as students #12 and #16 for segment 3.

From Table III we notice a clear pattern. The percentage of students making extensive use of CSR tended to *decrease* steadily over time (dropping from 60% during segment 1 to only 28% during segments 3 and 4); at the same time, the percentage of extensive users who "gained" shows a steady *increase* (from 47% during segment 1 to nearly 86% during segments 3 and 4). There are several facts which may account for this pattern. Of the fifteen students who used CSR extensively during segment 1, there were six who eventually abandoned the course, two who completed the course but stopped using CSR because they were passing virtually all of the pre-tests (and so considered it to be a waste of their time), and one who stopped for the simple reason that she had completed her thirty-two-hour requirement. The result is that those nine students do not appear as extensive users in the later segments. For those students whose extensive use of the software did continue into segments 3 and 4, the course material became more challenging, so that even those who had been routinely passing pre-tests in the earlier modules began to experience difficulties – and hence to register "gains". (One student confessed to failing the last three pre-tests deliberately; he was a little short on Lab hours and figured that was a good way to log more time on the computer.)

Table 1

Use of CSR by the Experimental Group

		Student Number										
	Module	1	2	3	4	5	6	7	8	9	10	11
Segment 1												
	M1315	3	3	3	1	1	1	1	1	0	1	0
	M1311	1	3	1	1	1	3	1	1	0	3	0
	M0867	1	1	1	1	1	1	1	1	0	1	0
	M0868	1	1	1	1	1	1	1	1	0	1	0
	M0563	1	1	1	1	1	1	1	1	0	1	0
	M0564	1	1	1	1	1	1	1	1	0	1	0
	M0828A	1	1	1	1	1	1	3	1	0	3	0
	M0828B	1	1	1	1	1	1	3	1	0	1	0
	M0865	3	1	1	1	1	1	1	1	0	1	0
	M0866	1	1	1	1	1	1	1	1	0	1	0
Segment 2												
	M1321	3	1	1	1	1	1	3	0	0	1	0
	M1322	1	1	1	1	1	1	1	0	0	3	0
	M1323	1	3	1	1	1	1	1	0	0	1	0
	M1324	1	1	1	1	1	1	1	0	0	1	0
	M1325	1	3	1	1	1	1	3	0	0	1	0
	M1326	3	2	1	3	1	3	3	0	0	2	0
	M0830	3	1	1	1	1	0	1	0	0	1	0
	M0831	3	3	3	1	1	0	1	0	0	3	0
	M1351	3	3	1	1	1	0	3	0	0	3	0
Segment 3												
	M1341	3	1	3	1	1	0	1	0	0	3	0
	M1342	3	1	3	0	1	0	2	0	0	3	0
	M1361	3	3	3	0	1	0	0	0	0	2	0
	M1362	3	3	3	0	1	0	0	0	0	3	0
	M1371	3	3	3	0	1	0	0	0	0	3	0
	M1373	3	3	0	0	1	0	0	0	0	1	0
	M1374	3	3	1	0	1	0	0	0	0	3	0
Segment 4												
	M1377	1	3	1	3	1	1	0	0	0	1	0
	M1376	3	3	3	3	1	1	0	0	0	3	0
	M1379	2	3	3	3	3	2	0	0	0	1	0
Test Scores												
	Test 1	81	77	99	99	92	70	90	85	74	45	66
	Test 2	86	89	93	97	97	85	89	89	77	75	75
	Test 3	77	77	93	91	91	82	78	50	81	63	69
	Test 4	98	77	90	95	93	73	81	94	88	75	46
	Final Exam	80	64	91	90	90	77	76	76	75	63	64
	Average	84	77	93	95	93	77	83	79	79	64	64
	Grade	S	S	S	S	S	S	S	S	S	P	P

Key:
0 = Did not attempt
1 = Passed pre-test
2 = Failed pre-test & post-test
3 = Failed pre-test & passed post-test

Table II

Use of CSR by the Experimental Group

		Student Number													
	Module	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Segment 1															
	M1315	1	3	3	3	3	1	2	1	3	0	0	0	0	0
	M1311	2	1	3	1	1	1	2	2	3	0	0	0	0	0
	M0867	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	M0868	1	1	3	1	1	1	0	0	0	0	0	0	0	0
	M0563	1	3	1	3	1	1	0	0	0	0	0	0	0	0
	M0564	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	M0828A	1	3	1	1	1	1	0	0	0	0	0	0	0	0
	M0828B	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	M0865	1	1	3	3	1	1	0	0	0	0	0	0	0	0
	M0866	1	1	1	1	0	1	0	0	0	0	0	0	0	0
Segment 2															
	M1321	1	1	1	1	0	1	0	1	0	0	0	0	0	0
	M1322	1	3	1	1	0	1	0	1	0	0	0	0	0	0
	M1323	3	3	2	2	0	0	0	2	0	0	0	0	0	0
	M1324	3	3	3	1	0	0	0	0	0	0	0	0	0	0
	M1325	3	3	1	1	0	0	0	0	0	0	0	0	0	0
	M1326	2	2	2	3	0	0	0	0	0	0	0	0	0	0
	M0830	2	3	0	0	0	0	0	0	0	0	0	0	0	0
	M0831	3	3	0	0	0	0	0	0	0	0	0	0	0	0
	M1351	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Segment 3															
	M1341	1	0	2	0	1	0	3	0	0	0	0	0	0	0
	M1342	1	0	2	0	3	0	2	0	0	0	0	0	0	0
	M1361	2	0	0	0	3	0	0	0	0	0	0	0	0	0
	M1362	3	0	0	0	3	0	0	0	0	0	0	0	0	0
	M1371	2	0	0	0	2	0	0	0	0	0	0	0	0	0
	M1373	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	M1374	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Segment 4															
	M1377	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M1376	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M1379	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Test Scores															
	Test 1	63	31	42	86	70	65	25	43	40	74		47	28	71
	Test 2	36		47	97	37	62	81	13		81		30	12	60
	Test 3	39		11		44		12	17		62				49
	Test 4										49				
	Final Exam														
	Average														
	Grade	W	W	W	U	W	W	W	W	W	U	W	W	W	U

Key:
0 = Did not attempt
1 = Passed pre-test
2 = Failed pre-test & post-test
3 = Failed pre-test & passed post-test

Table III

Summary of Students' Use of CSR by Segment

	Segment 1	*Segment 2*	*Segment 3*	*Segment 4*
Withdrawn	4%	8%	28%	52%
Used none	24%	36%	28%	20%
Limited use	12%	8%	16%	0%
Extensive use	60%	48%	28%	28%
Benefits of Ext. use				
Gain	47%	50%	86%	86%
No Gain	53%	50%	14%	14%

Extensive use = Participating in more than half the modules assigned for each segment.

Table IV

Test Scores and Grades for the Control Group

Student Number

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Test 1		47	97	65	34	83		76	73	93	23	75	38	20		48	67	
Test 2			97	78	17	91		83	80	89		95				38	86	10
Test 3			87	76	26	97		61	67	69		90				38	82	4
Test 4			86	72		98		89	80	69		96					71	
Final Exam			87	74		84		60	82	69		92					62	
Average			91	73		91		74	76	78		90					74	
Grade	W	W	S	S	W	S	W	S	S	S	U	S	U	W	U	W	S	W

Student Number

	19	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Test 1	9	85		77		96	75	85	53	72	47	37	62	83	51	56		65
Test 2	4	80		42		99	89	64	83	84	27		34	78	23	56		54
Test 3		47				96	57	69	73	72	3		51	67		50		20
Test 4		78				94	87	76	47	95				87		76		
Final Exam		55				85	60	68	67	86				81		46		
Average		69				94	74	72	65	82				79		57		
Grade	U	P	W	W	W	S	S	S	P	S	W	U	W	S	W	P	W	U

Table V

Comparison of Grades for the Control and Experimental Groups

	S	*P*	*U or W*
Control	36%	8%	56%
Experimental	36%	8%	56%

Student Outcomes

Only 28% of students in the experimental group chose not to use CSR at all, while 56% opted to use it extensively. (For this purpose, "extensive" is measured *relative to the time each student spent in class*, so that an extensive user is one who completed over half of the modules appearing in the portion of the course in which the student participated.) Of the fourteen extensive users according to this definition, eleven derived some "gain" (that is, passed the post-test after failing the pre-test and going through the tutorial in at least 20% of the modules).

If we look back to Tables I and II to see how these students fared in the course, we are led to make the following observation. Among the extensive users, no fewer than *eight out of fourteen* completed the course (seven with S grades and one with a P grade). Meanwhile, among the avowed non-users, only *two out of seven* completed the course (one with an S grade and one with a P grade).

Overall, the study suggests that extensive use of CSR *was* associated with higher success rates. 50% of the extensive users passed the course, while only about 18% of minimal users and non-users passed. Indeed, there is, among students in the experimental group, an undeniable correlation between use of CSR and success in the course.

It is natural to wonder whether that correlation provides evidence of a causal connection and, if so, *in which direction?* That is to say, did use of CSR cause students to pass the course, or was there some common attribute of the successful students that caused them to use CSR?

In order to address this question, we need to look at some data from the control group. Table IV shows the test scores and grades earned by students in the control group. A comparison of averages of the five in-class exam scores earned by students who completed the course reveals that in the experimental group the mean was 80.7, while in the control group it was 77.4—certainly not enough difference to be significant, particularly in view of the small size of these groups.

Table V compares the distribution of final grades within the control and experimental groups. The similarity between the grade distributions in Table V is astounding. If the "effect" we desire is to help students pass the course, then we must conclude that *access to CSR software was neither more nor less useful* than the traditional lab.

If extensive use of CSR software had actually *caused* a significant improvement in students' performance, then we would surely expect to see at least *some* difference in the percentage of S grades occurring in the two groups. Since we see no such difference, it is at least plausible to speculate that those extensive users of CSR who passed the course might have done so even *without* access to CSR. The fact that seven of the nine passing students in the experimental group were extensive users of CSR might be interpreted as a natural consequence of their fundamentally positive and cooperative attitudes toward learning.

Our focus should be on those six students in the experimental group who eventually abandoned the course in spite of having made extensive use of CSR during the time they spent in class. Might their negative experience also be attributed to their *attitudes* toward learning? How can the benefits of educational technology be integrated with traditional human intervention to alter those attitudes?

Recommendations

First and foremost, this study indicates that there is *no difference in overall performance* between MAT 0024 students using the traditional math lab exclusively and students using the lab in conjunction with access to CSR software.

Proper emphasis should be given to the word "access." If students are offered the *option* to use CSR software as part of their required Math Lab activity, together with a deliberate orientation to the software and a bit of gentle encouragement, we can expect that approximately half of those students will choose to use the software

extensively, and that in turn approximately half of the extensive users will complete the course with a satisfactory grade. It must be left for another study to determine what might result if use of the software were *mandatory*.

The study furnishes no reason to expect higher success rates in MAT 0024 as a result of introducing CSR software into the curriculum. Neither does it rule out the possibility that further experimenting may produce more positive results and that CSR may find its way into the curriculum. Such a change, if it occurs, will certainly require an evaluation of specific modules in CSR with particular reference to the pre- and post-tests (both format and difficulty level), addition of more modules to cover the syllabus for MAT 0024, a close examination of how best to use a self-paced instructional software vis-a-vis a time-bound group instructional mode, and, lastly, an investigation of how to ensure that the students who need the help most do get it.

Administrators' Perspectives

Victor Nwankwo earned his B.S. in Computer Science (1986) and a Masters Degree in Public Administration (1989) from Texas A&M University. After completing his studies, he worked with Texas Transportation Institute as a Research Associate for about a year and half before joining Miami-Dade Community College in 1990 as the Software Implementation Coordinator for Project SYNERGY.

Software implementation is the meeting point of success for all parties involved, hardware vendors, software publishers, faculty, administrators, and students. Our first round of implementation has been successfully completed, but not without difficulties and conflicts. Following is a discussion of some of these difficulties and conflicts encountered as we progressed through the implementation, as well as the ingredients for successful implementation.

In spite of volunteering to participate in the project, some of the faculty were skeptical about the process of applying technology to their teaching. They all started not knowing exactly what to expect from the students, but as we progressed through the implementation, their interest began to grow when they saw their students' enthusiasm for the Electronic Classroom. The faculty then started seeking ways to improve the quality of what students were being exposed to since students were asking more questions about their performance and how best to take advantage of what the computer had to offer.

Our project director was able to assist each faculty member to formulate personal goals for his/her involvement in implementing software. Examples of the questions that initiated positive response from the faculty are as follows: "Based on what you have seen and heard in the orientation and our discussion about various uses of the software, what would *you* like to see as the outcome for you and your students?" "What would make it worthwhile for you to invest your time and effort?" Through this type of discussion, the faculty developed their own personalized research designs to answer their personal questions. This may have seemed insignificant at first but later proved to be vital because it made most of the faculty become more immersed in our implementation strategy.

After setting such a stage, the faculty were given unlimited boundaries for incorporating the software for their use. As they reviewed and selected modules from their respective software, some developed interesting and creative ways of adopting the same piece of software. In spite of the limitations in the software packages, we were able to accommodate some of their unusual requests. But one should bear in mind that some customizations do present problems later and should be given adequate thought in terms of considering their implications. For instance, in one of our software packages you can create your own Routing Activity, which may have placement tests. In one of the Routing Activities, we imbedded these placement tests, but you have to unlock students to retake the placement test if you want them to master that particular placement test. While the students can unlock other aspects of the modules such as the tutorial, they have to be unlocked to retake the placement test if it is imbedded within the activity. This worked fine initially but became time consuming when the students had mastered everything else except the placement tests, and they anxiously waited for the lab manager to unlock the placement test. If we had known that it would require that amount of time, we would have avoided this customization. "You live and learn."

Application of technology in teaching and conducting research simultaneously presented a burden and conflict of interest. Some of the faculty members felt the need to protect their students from being overexposed to various forms of testing that are required for research. We used only one test (the CPTs) after all as pre- and post- tests, yet some faculty felt that it was taking time away from their instruction.

There were other factors that were beyond our control. For instance, it would have been nice to have had all the students take the pre-test by the end of the first week of the term, but some students change their class schedule during this period and don't get tested on time. When they are tested in the second week, that process affects other students who are in the Electronic Classroom for instruction.

There were some tangential problems associated with some of the software that required immediate attention as students worked through their individual modules. Occasionally, an error would occur with a particular student's record (indicating, for example, that the student had already completed one of the modules which the student had not even started). This required that the files for that particular module be deleted to allow the student to restart the module. There were times when students would forget their password or even how to sign on and had to be taken care of right away. Even though we were able to muddle through some of these unexpected problems, we have to caution the readers that these and other kinds of unexpected problems will show up, and when they do, their resolutions will require immediate attention.

Computer-aided instruction provides an avenue for personalized care in learning which the underprepared student needs most. However, to reach the level at which they can use the computer effectively, they need someone close to provide that extra hand at the point of frustration. The first few weeks of the semester should be devoted to students to ensure that they go beyond learning how to use the computer to actually learning from the computer. This, I believe, *is a deciding factor* on how the student will adapt to the system and to the software for the rest for the term. We have been fortunate in this regard to have two outstanding individuals, Elizabeth Sotolongo and Mark Paris, as EC Managers. They were there for most of the students. But given the heavy use in the EC, there were some students who could not be reached, which may have been responsible for their skipping the EC and eventually dropping out.

It is also critical for the student to see a clear connection between the faculty and the computer lab. We saw a dramatic difference between classes where the faculty came to the EC to see and help students and those that relied solely on the computer's weekly report. Students need to see the Electronic Classroom as an integral part of their classroom activity rather than as an optional responsibility. We found that more time was required initially to monitor students' progress by reading the computer reports and in providing feedback to students about their performance.

Despite the amount of planning and preparation, we found these to be inadequate during the actual implementation. There were certain circumstances that we were not aware of until close to the end. Consequently, initiating appropriate actions was rather difficult or came a little too late. For instance, in analyzing the data for the research study, we noted clear indications that some of the students were failing the modules and perhaps needed some human encouragement or guidance. The majority of these students dropped out. In the next round of implementation, we will pay greater attention to this contingency.

Proper implementation requires an enormous amount of time, effort, and coordination of all individuals involved, at least initially, but that amount tends to lessen as each becomes more knowledgeable about the aspects of implementation and all have established a viable means of communication. If we are to succeed, we must all work cooperatively for systematic development of a model of simplicity, efficiency, and effectiveness as we seek technological solutions for assisting the student to become prepared for college.

Ed Eisel is the Project Analyst for Project SYNERGY. He joined the Division of Educational Technologies of Miami-Dade Community College in 1983. Prior to this he worked as an EDP Consultant for the Department of Community Affairs in Tallahassee. He has also taught at all grade levels from elementary school to college. He has experience working in various mainframe, mini- and microcomputer environments. He earned his B.A. from St. Charles Borromeo College in 1967 and his M.Ed. from the University of Miami in 1974. He has completed all the course work for a Ph.D. in Educational Research.

As the Project Analyst for Project SYNERGY, I had to set up the Electronic Classroom for use with Project SYNERGY. I would like to share with you some of my experiences and some reflections on them.

- For an EC to be truly successful the software and hardware must adapt to the students, not vice versa.
- Find a school that is doing something similar to what you wish to do and get all the information you can from them. Be prepared to do the same for others after you have your electonic classroom up and running.
- Software that works well by itself may cause you some problems when you attempt to run it with other software on a network.
- You will reach the point where you are certain that you cannot "get there from here"; sometimes that is true, but often if you step back and rethink things, you may be able to find the solution.
- No matter how well you design your EC, the actual implementation will need to be modified, so budget accordingly.

ECs are getting better. They are becoming more integrated and easier to use, but if the software is truly meeting student needs, then someone has probably had to do a lot of work to modify it. The more you wish to do with your network, and the more you wish to modify it to meet your needs, the more work is required.

A truly successful electronic classroom must always keep the needs of the students and faculty as the primary focus. While this is a case of stating the obvious, it is important that the technical people who are creating and maintaining the electronic classroom not lose sight of this. Whatever can be done to modify the physical layout, the computer interface, the individual software, and so on to benefit the student should be done. Therefore, the technical people need to work closely with the faculty in designing and implementing the electronic classroom.

If this model is followed, the work of setting up and maintaining the electronic classroom may be more complicated. If the technical people install the system according to the publisher's description and tell the faculty and students what they must do to use it, they will probably complete their job quickly and easily. However, this does not always meet the users' needs. Therefore, it takes a little more intervention and tweaking to get the system to run as required. It is easy to say that certain things cannot be done, but if extra time is spent in thinking out the situation, some creative solutions can usually be found. It also helps to speak with people who already have networks similar in scope to the one you are planning to build to see what they can offer in the way of suggestions.

If the users want the network set up in a way that can't be done, rethink it and work with the publishers to get the software as close to the way the users want it as possible. It does not always work out, but the closer you can come to tailoring the system to the meet the users' needs and not asking them to meet the system needs,

the more productive the educational experience will be. Not to mention the happier the faculty will be with what you have done for them.

In our situation we wished to be able to provide a variety of software, and this led to questions of compatibility. Could these various packages co-exist on the same network? There are publishers that have solutions to the problem if you wish to go exclusively with their software; however, if you choose to do a little mixing and matching it is not always so easy. My experience is that in a setting where you have a variety of faculty, you are probably going to need the flexibility of being able to offer what each faculty members wants, not imposing on them one set system.

It seems that no matter how much planning goes into setting up a classroom, after it has been in operation there are modifications that could be made to improve it. If this fine-tuning of the electronic classroom is budgeted for beforehand, it will allow some flexibility in the final design of the electronic classroom. Two examples come to mind from our situation. We had set the system up with six dot matrix printers. The noise level is just too loud, so we will either have to find some way to muffle the printers or obtain laser printers. We also have out tape backup in the server. An administrative workstation with the internal tape drive would be preferable, but we do not have any workstations which are capable of supporting an internal tape drive. In both of these cases, there were good reasons for doing what we did; it is only now that these other factors appear, so it has become necessary to modify the setting.

Let me emphasize how important it is to be sure that you have enough support people to run your electronic classroom. It is essential that there be someone in the electronic classroom at all times to help people deal with the system, and that these people know how the software on that system works and are able to communicate well with the users.

Finally, there is a lot of work, frustration, and learning that goes into setting up and running an electronic classroom, but the benfits to the students certainly justify the cost, time, and effort necessary to make it happen.

Jeffrey D. Lukenbill is the Dean of Academic Affirs at the North Campus of Miami-Dade Community College. Prior to coming to the North Campus in 1985, Dr. Lukenbill served as the District Dean of Academic Affirs in the college's District Administration. Dr. Lukenbill's degrees include a Bachelor's degree in English, Master's degrees in Lingusitics and in Education, and a Doctorate in Education. He has been president of the National Council of Instructional Administrators, has served on the Advisory Board for the Southern Region of The College Board, and was a member of the Bord of Directors of the Association of American Colleges in Washington, DC. He has worked closely with the Dade County Public Schools on numerous projects and served on the Advisory Committee for the Gifted Education Program.

A dean's dream! Limited resources, lack of personnel, and busy schedules, matched against exploding technology, new emphases on teaching and learning, and increasing student needs—a dean's nightmare! Project SYNERGY, an electronic classroom, faculty experimentation and computing expertise—a dean's dream!

My guess is that I have faced the problems and shared the frustrations of most academic deans around the country. In our efforts to improve undergraduate education, specifically the quality of instruction, how do we keep up with and tap into the great potential of computer-assisted instruction? Our first concern has had to be providing computing hardware and software for programs which demand these resources as essential components of their curricula. This task itself has been almost insurmountable. Resources to provide computers and hardware, with opportunities for other programs for which such resources would be enhancements to the program, has been virtually impossible on a large scale. The long-term effect is that the potential to improve teaching and learning is not realized, and the ability to develop the professional expertise of faculty members is severely hampered.

What has Project SYNERGY meant for the faculty, for the campus, and for me? For the faculty it has been more than simply several instructors receiving computer training. Rather, it has been an opportunity for them to explore, to experiment, and to conduct some practical research. It has enabled them to become excited about their teaching and to spread that excitement among their colleagues and their students.

For the campus it has provided a physical center and an educational focus to our efforts to develop a comprehensive plan for applying computer technology to teaching and learning. Such a center seems to me to be essential for any comprehensive development.

For me, as academic dean, Project SYNERGY has been a vehicle for progressing toward an educational goal which I have established as a priority—to support and to promote campus-wide applications of computing technology to teaching and learning. It has been invigorating not to "dream idle dreams," but rather to see one's dreams become a reality.

Gregg Sharp is the Director, Center for Teaching and Learning, North Campus. He received his B.A. in Education from Montclair State College, in 1971, his M.A. and Ph.D in Teacher Education from University of Illinois, in 1976 and 1980 respectively. Prior to joining Miami-Dade Community College in 1990, he served as the Educational Specialist in the Office of Instructional Resources at the University of Illinois and as the Manager of Training and Instructional Design for the Southeast Bank in South Florida.

For the past five years Miami-Dade Community College has been involved in a long-term comprehensive project that is looking at the teaching and learning process. Goals of the Teaching/Learning Project are to improve the quality of teaching and learning, make teaching and learning the focal point of college activities and decision making, and raise the status of teaching at Miami-Dade.

In 1986 Dr. Robert McCabe, President of Miami-Dade Community College, suggested that "the focus of our efforts must be directed toward faculty development in order to strengthen teaching/learning and other functions where faculty and staff work directly with students." This year that focus has become a reality at the North Campus through the establishment of the Center for Teaching and Learning, the opening of the Electronic Classroom, and the implementation of Project SYNERGY. Project SYNERGY exemplifies the importance of having administrators, faculty, and support staff work as a team to achieve the institutional goal of utilizing educational technology in the instructional process.

The IBM networked system used in Project SYNERGY is functioning admirably. The equipment is durable and reliable. Hardware failure has not occurred during the project despite heavy use. The PLATO and CSR programs seem to have been accepted readily by the students after a normal adjustment period. Perhaps one of the most powerful measures of the program's impact is the fact that most of the faculty participants are studying instructional applications that will last well beyond the time and scope of this particular project. A goal of the Center for Teaching and Learning will be to continue the momentum of this project by providing faculty with the resources and expertise to research technological applications which best meet their instructional goals.

Holistic Assessment of Writing

Michaela Segall joined Miami-Dade in 1973 as a part-time faculty and taught French, English as a Second Language, and English at two of the campuses. In 1984, she became a full-time faculty in the Department of International Language Studies and is currently the Chair of the Department of Basic Communication Studies at the North Campus. Prior to joining M-DCC, she taught at Allegheny Community College. Michaela earned an M.A. in French Literature in 1969 from the University of Pittsburgh, and a Ph.D in Administration of Higher Education in 1984 from the University of Miami.

When we, the Department of Basic Communication Studies, committed in the Winter of 1989-90 to a holistic evaluation of student writing as an exit requirement for our College Preparatory program, several running currents merged together. First of all, the faculty had had exposure to this type of evaluation process used in the English Department on our campus. Second, as department chair, I brought enthusiastic support to the project through my personal involvement with holistic scoring in the ESL program at our school. One faculty member had been directly involved with CLAST (College-Level Academic Skills Test) holistic scoring for the State of Florida, and the Associate Dean for the Communication Division was in favor of the direction we were taking. The important thing is that this was a faculty-initiated change with strong administrative support.

A faculty member was released to put together a training packet for holistic scoring closely inspired by the Educational Testing Service's *Manual for Scoring the Writing Sample* by Mary Fowles. (Mary E. Fowles, *Basic Skills Assessment: Manual for Scoring The Writing Sample - Analytical Scoring, Holistic Scoring*, Princeton, New Jersey: Educational Testing Service, 1978.) Another faculty member was released to develop and implement a departmental exam process. However, the entire core of full-time faculty members participated in the writing of topics and in developing range finders for the pilot study. Along the way, we also set up workshops in holistic scoring and on the writing of topics for the faculty.

Some instructors, of course, had reservations. Would we be relinquishing our academic freedom in the classroom by submitting to departmental evaluations of our own students' writing? Could a decision be made about a student's writing ability based on one writing sample? Isn't the classroom instructor who has spent a semester guiding and evaluating student writing the best judge of whether a student should pass or fail the course? We dealt with these valid questions by chiseling out a series of group compromises. Our most basic decision was that there would be two departmental exams in the Fall of 90-91. All students would write the first exam. Although the classroom instructor would be the first examiner to read and score the papers, a second examiner would read the papers at a group session, and a third reader would break the tie when necessary. We agreed that the classroom instructor would decide which student papers would be submitted for the second departmental exam. The classroom evaluator would also be the final evaluator and could ultimately overturn the departmental decision.

The results of our first effort taught us many lessons. For instance, we observed that not all our instructors were reading on target. Let me be more specific. We represent a large department with an average of fifty sections during a major term serving between 1,200 and 1,500 students. We have a core of five full-time faculty who teach developmental writing exclusively, three others who teach writing and reading in our program, myself, and another twelve to fourteen instructors who teach part-time. What we discovered was that a large

number of discrepant papers (papers that required a third reader) came from classes taught by adjunct instructors. As a result, we decided to create a "buddy system" which teamed up full-time faculty with part-time faculty in an effort to nurture a more frequent professional dialogue on student writing diagnosis and placement. Additionally, we provided a financial incentive to attract adjunct faculty participation in our group holistic scoring sessions at the end of the Winter Term (90-91). We also decided to research cases when the classroom instructor overrode the outcome of the department exam(s) and allowed the student to exit the program in spite of the collective decision.

Following our Winter 90-91 experiment with holistic scoring, some of our instructors who had originally wanted to maintain control over evaluation now concluded that perhaps both first and second readers should be other than the classroom instructor, and only when the results of the department exam conflicted with the classroom instructor's assessment of student performance throughout the term should a second sample be submitted for department scoring. This, it was felt, should substantially decrease the number of papers submitted at the time of the exam. (We discovered that on the average, instructors were submitting samples of 50% of their classes for second evaluations.)

The most interesting outcome, however, has been our shift in energy from an "exit" focus to a "placement" focus. Even before our Winter experiment, we decided to score the papers in our lower-level course along with the papers in our upper-level course. As a result, the four-point scale used in holistic scoring acquired a curricular program value along with its assessment value of the quality of student writing.

Thus, a 1 (lowest score on a 4-point scale) identified a paper that belonged in our department's lower-level course, a 2 identified a paper that belonged in our department's upper-level course, while a 3 or a 4 identified a paper that deserved to exit the college preparatory program. Naturally, this placement interpretation could not have evolved without the active participation of the English department faculty at a common workshop sponsored by our department. We needed input from the receiving department's faculty in making decisions about readiness for their courses.

This is the stage that we have reached today. Next semester, we will begin to train adjunct faculty to score holistically at the beginning of the term, in time for them to apply this method to the evaluation of diagnostic writing samples used in moving students internally from one level to another during the first two weeks of classes. A full-time faculty member is being released to develop a system for adjunct faculty training. It is important to note that the faculty will continue to provide "buddy" support throughout the term, but the theoretical groundwork will have been covered in individual sessions with the trainer. We have also collected the data to investigate the academic progress of the first group of students assessed holistically two semesters ago (Fall 90-91).

Overall, the department-wide holistic assessment of student writing has emerged from the humanistic perspective that characterized the outlook of our core of writing faculty. The developmental program is solidly anchored in individualized instruction provided in the classroom and in our College Prep Writing Lab through instructor conferences and tutor assistance. Currently we are exploring adding computer-aided instruction to our arsenal of teaching/learning strategies. As a department, we feel that the holistic assessment effort has raised the exit standards for our College Preparatory program, has strengthened the correlation between course competencies and actual student performance, and has improved our articulation with the college-level English program. Although it is clear that this has been a collaborative experience, meaningful to faculty and program development, the challenge that awaits us is to now prove that the positive results of our department effort also translate into significant student outcomes.

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This document was produced with the IBM Advanced Academic System software.

Cover design was done by Lee Kline, Miami-Dade Community College.

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JUL 17 1992